Exploring the customer experience for 4DSwing golf coaching technology.

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2010-2011

Aalto-yliopisto
Taideteollinen korkeakoulu

TIIVISTELMÄ

Tekijä		Työn julkaisuvuosi
Thomas Francis Hutton		2011
Laitos	*Koulutusohjelma*	
Muotoilun laitos	Teollinen Muotoilu, MA	
Työn nimi		
Exploring the customer experience for 4DSwing golf coaching technology.		
Opinnäytteen tyyppi	*Kieli*	*Sivumäärä*
Tuotekonsepti suunnittelu	Englanti	57

Tiivistelmä

This thesis explores the experiential dimension of 4DSwing golf coaching technology. The technology, based video cameras and machine vision algorithms, measures swing performance details that are invisible to the naked eye or video cameras, such as speed and movement of club head, wrists, hips and shoulders. The thesis explores the journey of interpreting the 4DSwing brand and developing a three-dimensional representation of it. Through observing users and manipulating the scene, I uncover and explore the intangible and tacit nature of the product. I proceed to combine qualitative observations with a theoretical background, to design a space that triggers positive feelings. The aim is to create a design that captures the spirit of the brand, encourages effective communication between users, and packages the hardware in a safe and tidy manner. A thorough review of the 4DSwing brand is necessary, and close cooperation with the company is a key factor to establish a solid reference background, on which the actual design is then built. I use theoretical perspectives on product development to set my ambitions for the project, to meet the standards of the sponsoring company. With this in mind, I attempt to highlight the importance of the emotive aspect of design, and how this constitutes a large portion of the user experience. The design phase of the project is split into three stages. After each stage, a common criteria is used to evaluate ideas. The proposed concept is then explored through standard design methods, and developed to a stage where it is possible to understand the main features of the design. Final details can only be developed once a suitable manufacturer has been found.

Avainsanat

Experience design, architecture, branding, contagiousness

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Introduction

A technological push towards innovation may results in a product that at first makes little sense to consumers. Such new technology is difficult to package into a format that is appealing if the experiential dimension is ignored. The elements studied and explored in this thesis are concerned with the experiential factors of the 4DSwing product. 4DSwing have developed a unique way to measure the dynamics of a golf swing using cameras and intelligent software. Aggressive attention towards the software and the general functioning of the equipment, causes a lack of physical presence. The central problem examined in this thesis involves creating an attractive environment that separates the 4DSwing product from its surroundings.

Key drivers that determine the success of any product include the ability to be contagious and emotional. The product needs to arouse a feeling of pleasure when seen in order to differentiate itself from its surroundings. The brand is also important in selling the product, which is why it needs to be embedded in every aspect of the product. It needs to be genuinely present everywhere for it to feel authentic. Otherwise the brand runs the risk of being seen as artificial, making the product fall flat in the eyes of the consumer. The framework for this thesis is found in the work of Toni-Matti Karjalainen and his book Semantic Transformation in Design. He highlights the importance of the brand for successful product development, and offers insight into how and why a brand can be transformed into a three dimensional form. The reasoning for the experiential approach to this thesis is justified by Karjalainen as he sees the need for "stable brand associations … to provide customers with a trusting touch point to products" (Karjalainen 2004, 9). Further still "the product remains the key aspect through which the brand prospers or withers. This relationship exists particularly in fields in which a physical product is the main interface between the brand and its user" (Karjalainen 2004, 9). Since design is communication, and embedded in the product; "the total experience within the encounter between the product and the user combines aspects of both tangible product features and intangible brand associations" (Karjalainen 2004, 9).

Wether or not consumers take the product to their liking is critical. Karjalainen draws on the research of Montague, summarizing his ideas by saying that "the connection between product experience and brand experience is created by 'the promise' and the 'the delivery.' The promise creates a planned expectation for a customer through brand identity and product appearance. The delivery is provided by the overall product design, the product's performance, and the sustained communication of the brand. The delivery creates long lasting impressions, develops loyalty, inspires referrals, and empowers the brand or product to extend itself into new areas. In Montague's model, product design

holds a central role in the creation of expectation by issuing a promise and by exceeding this promise in its delivery" (Karjalainen 2004, 10).

This thesis can be seen as an attempt to realize these thoughts through bringing the product character forward through tangible and intangible qualities. The subject of turning a golf swing analyzer into a desired consumer product experience is no small task. This study is focused on developing the product architecture to the point where the experiential dimension reflects the brand and company values of 4DSwing. The study includes a theoretical part which looks into the many factors involved with creating experiences with product. The thoughts and models gathered in the theory are used to guide the design process.

The conceptual design work involved in this thesis is reliant on a user study. By combining a theoretical framework and qualitative observations, the attempt of this thesis is to provide the sponsoring company with insight into the importance of product aesthetics, the experiential dimension, brand extension possibilities, and an understanding of the behavior of their customers. By developing a concept, the research is translated into something tangible. This allows for an evaluation for the allocation of resources by the company, to commit to the experiential process of the product. The work gives an overview of what experiential design is, and how it can be used to support businesses. The study goes to some length to explain important factors in what makes a product meaningful, contagious, and emotional. In doing so, it defines the scope of which features and elements are important for the intended message.

1

Personal positioning to project

1.1 Personal background as a professional golfer

4DSwing is a company providing golf swing analysis equipment for the golf industry. They provide players and instructors with the opportunity to view and analyze information that is valuable for developing a better game. The reason I felt drawn to this project was my background as a professional golfer. I have played golf for over twenty years, having competed on a professional level internationally. I also teach golfers of all ages and different levels of skill, which is why I also have a personal agenda to learn to use the machine and gain knowledge of the data the 4DSwing system is able to provide.

1.2 Using Hobbyist Knowing as an asset

My background to the project has been termed "hobbyist knowing" (Tanja Kotro, Hobbyist Knowing in Product Development, 2005). The claims that given a personal background to a particular process or situation deepens the individual's understanding of what is happening, which accounts for a greater speed of action and routined behavior. A hobbyist has a level of comprehension which is defined by involvement, motivation and experience. Such internal knowledge is tacit by nature. Hobbyist knowing is part of the pragmatic perspective where "knowing is understood as part of concrete action" (Kotro, 2005). In practice hobbyist knowledge "is not suggested as a substitute for design methods, it is possible that hobbyist knowing can serve — because it is social by nature — to overcome factors that hinder the use of user centered design methods, such as difficulties in gaining access to user communities, or in recognizing user communities and knowledge embedded and embodied in them."

The drawback of this knowledge is also relevant to address; the ability to question personal opinions and arguments. The objective of the work is not to 'design for myself' but consistently with the company brand and user needs. The thesis can thus be viewed as an effort in playing to the strengths of hobbyist knowing.

2
Company information and background

2.1 Company profile

The invention of the 4DSwing apparatus is the creation of Seppo Karikko, CEO and founder of Base Vision Ltd. The company is committed to providing learning tools and services to globally. In their own words, as presented on their website, the company describe their product as following:

"4DSwing has launched the first ever golf swing analyzer in the world providing golf players and coaches comprehensive and very detailed data about everything that happens during a golf swing without attaching wires, sensors or vests to players' body or club.

4DSwing uses hi-speed video cameras and machine vision algorithms to measure swing performance details that are invisible to the naked eye or video cameras, such as speed and movement of club head, wrists, hips and shoulders. 4DSwing is not only the most advanced golf swing analyzer in the market, it's also a complete toolset for golfers at all levels for taking their learning and coaching of golf to the next level" (4DSwing website 2011).

In addition, the data is stored on servers, which provides users with remote access and enables remote coaching. The analyzer relies on high-speed video cameras that run at 100-500 frames per second, which capture a swing from

Pictures describing the current state of the 4DSwing product.

all angles using eight cameras strategically positioned on an aluminum frame. Algorithms are used to interpret the data, which is formatted into a user interface that consists of video playback, a wide selection of numerical values and graphs. It must be noted that the data provided by the machine is purely informative and does not translate data objectively or provide users with instructional information. The practical interpretation is the responsibility of the instructor.

2.2 Description of existing hardware and software

In order to best evaluate my contribution to this project, a detailed description of the existing product is necessary. The existing product can be divided into two parts; hardware and software. From these, a description of the existing user experience can be drawn.

2.2.1 Hardware

As mentioned earlier, the hardware that captures the swing consists of eight hi-speed cameras, that are mounted on a custom aluminum frame. The frame also supports lights, with some additional lights placed on the ground. This frame and equipment is housed in a 6.75m x 7.75m x 3.25m rectangular tent, which is supported by aluminum trusses and crossbeams (ill. 2). The walls of the tent are made of canvas (ill. 1). The exterior canvas is fireproof Airtex canvas, and the interior is made from a light-green canvas which is the optimal background for the

cameras to distinguish between person and background. The inside of the tent resembles a special effects studio, with green walls an brights lights (ill. 5). This gives the product a high-tech feeling, and creates a memorable impression.

Outside of the studio, two powerful computers run the software required to operate the cameras and analyze the data. Two large computer screens are needed to visualize the data, as this gives a larger surface over which to distribute the windows and browser. A keyboard and mouse are needed to operate the user interface. A server and a switch that changes the operational status of the computers is also housed within the same space. This results in a large number of wires and extension cords. At present, this hardware is placed on an adjustable table from IKEA (ill. 3). It must be remembered that this is the implemented solution at Season Golf training facility in Suomenoja, Espoo, which is the location of the first commercially erected 4DSwing studio and focus of my research.

Golf clubs are provided by 4DSwing, because the shaft of the clubs are covered with white tape in order for the cameras to recognize them better. An orange wrist band must be worn by the user on their left hand for the same reasons. A golf ball is also provided.

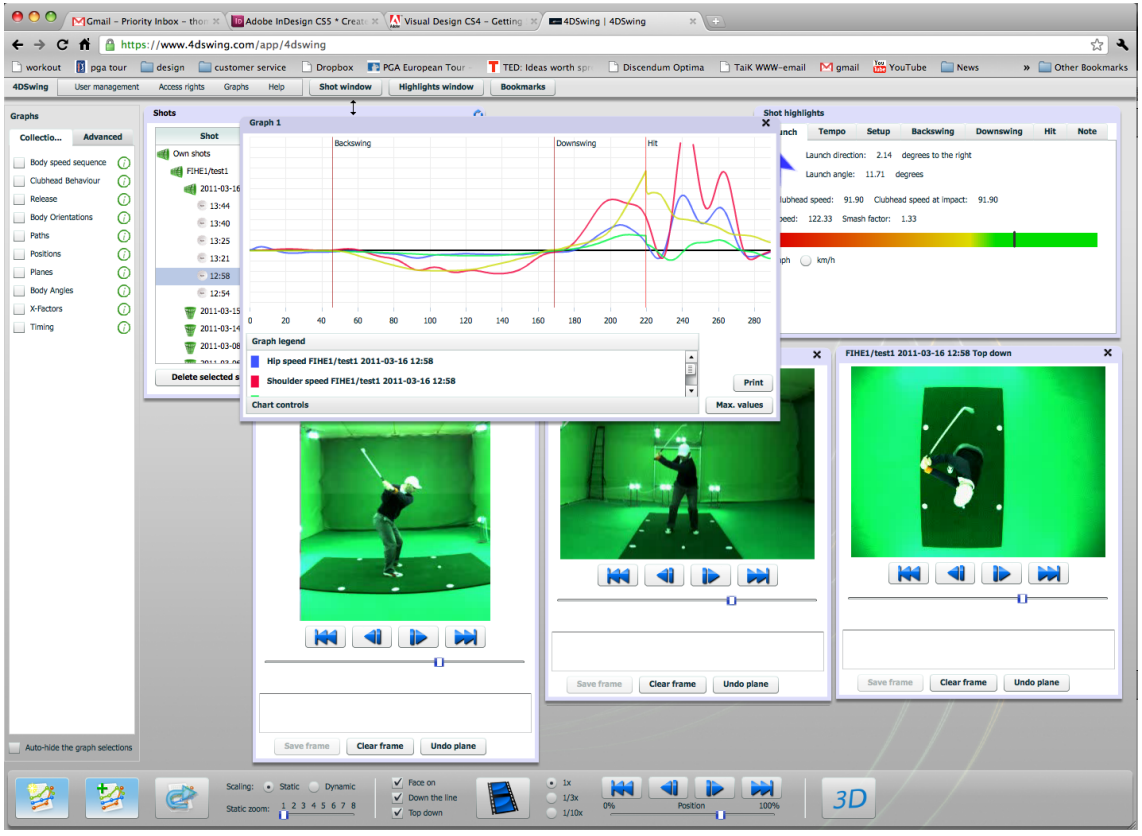
2.2.2 Software and user interface

The data is analyzed using a 4D shape recognition algorithm, which measures "every detail of your club head, wrist, hip and shoulder movement during the swing and transforms the data into an exact 4D model. Artificial intelligence algorithms such as self organizing maps, learning vector quantization and Bayesian classifiers analyze your swing" (4DSwing website 2011). The data is displayed using a user interface that has been developed by 4DSwing, and is available online.

2.2.3 Working with the system

To begin, the instructor or operator must switch on the computers, screens, and power up the lights and cameras. The lights and cameras are activated from within the studio. The operator is then required to initiate the software that runs the cameras by opening a program on both computers. To do this, they must use the switch that decides which computer is providing visuals to the monitors. After this, the software that operates the cameras is launched, which requires a log-in and setup. A web browser is used to operate the final interface, which forces the operator to often switch between programs.

Once the system is ready to be used, the player must go through a step-by-step process which is guided by the operator. Once the cameras are calibrated, the system asks



A screenshot of the 4DSwing user interface. There are many graphs and video frames, which makes it more convenient to use a large monitor or multiple ones.

for a ball to be placed on a specific spot on the hitting mat placed inside the studio. The person who places the ball must then exit the studio as not to distract the cameras. It does not take long for the cameras to recognize the ball, after which it is safe for the player to step inside the studio. At this stage, the player may take any desired number of practice swings. Once the ball is hit, the system recognizes the change. The cameras begin to analyze a certain amount of frames before and after the hit, which results in one sequence. After hitting, the ball can be placed on the same spot, but the player is required to, once again, exit the studio until the cameras are ready and the system is done analyzing the first swing. This sequence of events can be repeated for as long as necessary, although it is beneficial to analyze the results from one swing first, and then perform another with a new thought or feeling that was derived from the data.

Usually one swing is enough to get a clear idea of how a person is swinging. It is therefore more beneficial to use the system with intervals where the subject has had time to digest and implement the changes as suggested by the instructor. The time it takes for the computers to analyze a swing sequence is almost three minutes. During this time, the comfort of the situation is dependent on the social interaction skills of those present.

Because the player is guided through the process and

analysis of the data, a high level of interaction is required between those present. The experience is thus social in character. There are many moments of uncertainty, which are dependent on the articulation of the operator and the interpretation of the player. The feelings and emotions of both the operator and player must be considered when interpreting the user experience. For example, both parties are concerned with the durability of the equipment, as the environment, although technical, may also intimidate and restrict the ability to make a natural swing inside the studio. The success of a session thus not only depends on getting good data, but on the emotional connection that users gain from having used the 4DSwing product. It is therefore important to note that the brief created for this thesis is concerned with the user experience of 4DSwing.

2.3 Introducing the 4DSwing brand

Apart from the hardware and software, 4DSwing also possess a visual identity. Their brand has been developed by a design agency prior to this thesis, and must be considered when reviewing the company profile as this thesis explores the three dimensional expansion of the brand.

The 4DSwing brand is built on values that reflect the following attributes:
Swing: *analysis and equipment*
Mathematics: *continuity, repetition, precision, measuring*
The next level: *"pumping it up", more, "all the way to 11"*
Learning and collaboration: *guiding light, doing, reflection, learning, improving*

The company motto Force, Precision, Movement has been devised from these characteristics. The purpose is to convey a high level of energy, technology and ambition.

Understanding the brand is useful in creating consistency for the product language. A thorough study of the brand background material was necessary to gain the correct interpretation that would help guide the design process.

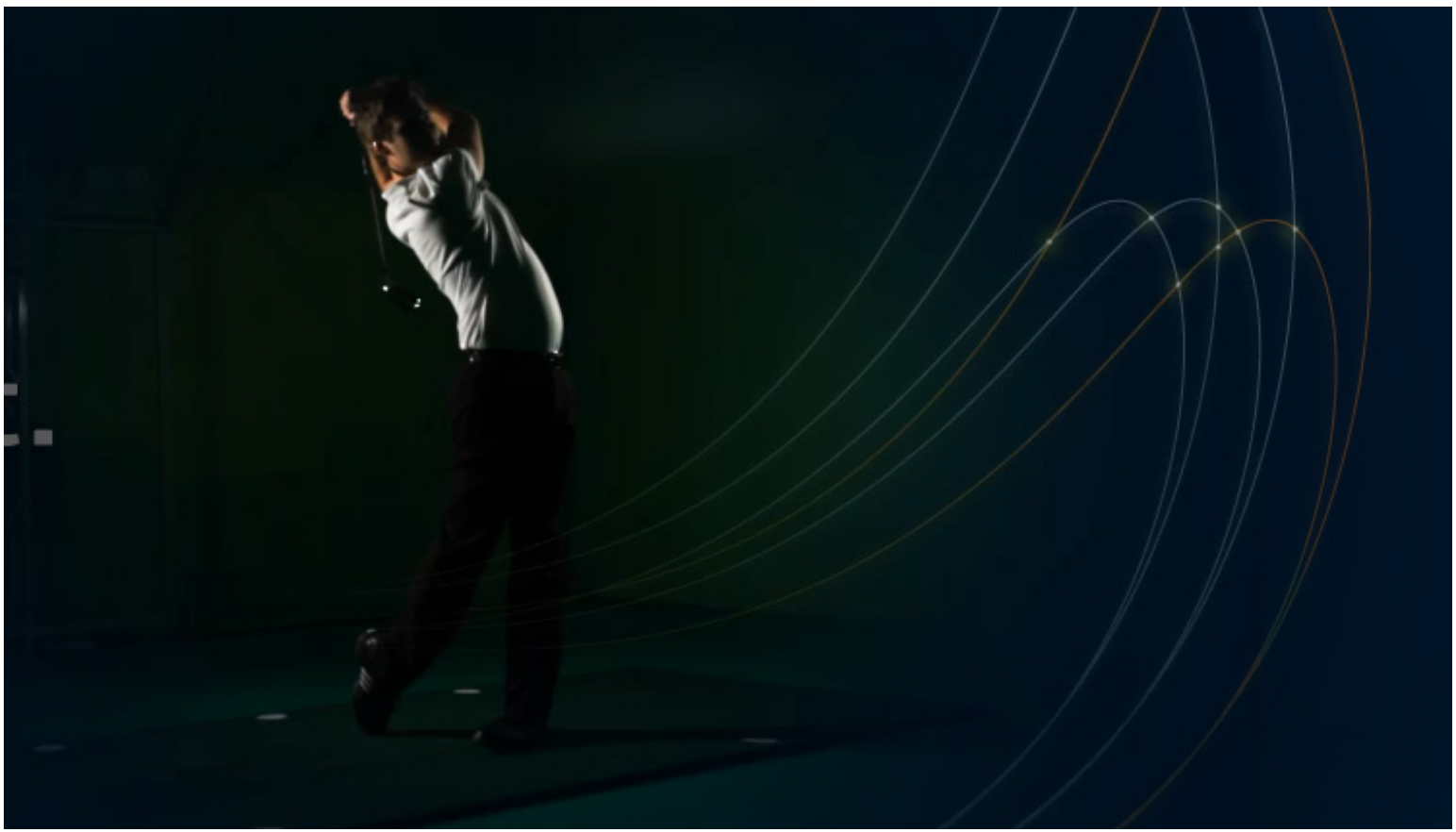
Opposite: Examples of the brand, including motto, logo, font and sample picture.

Force.
Precision.
Movement.

Max Font Family

ABCDEFGH abcdefgh 1234567890

4dSWING



3
The brief: Experiencing the brand and product holistically

4DSwing have all the essential equipment for analyzing golf swings. However, the composition of the hardware is lacking in appeal that would attract the curiosity of potential customers, nor does it represent the well articulated two dimensional graphic identity. The space in which the operator and player interact to interpret the data is a result of circumstance and not through careful design. This leaves room for many errors that hinder the smooth communication between people, and restricts freedom of movement. What is needed, is a clearly defined space that acts as the facade to the studio, from where the software is controlled and the analysis take place.

The brief for the thesis work is to conceptualize a space, which is designed to enhance the user experience of 4DSwing.

The aim is to create a space that communicates the values of the brand, is visually appealing and makes the user experience complete. The space should allow for easy access and unobstructed movement, while simultaneously give privacy to the users.

4
Literature review: Experience design as the next big thing

4DSwing is an example of a product that has been turned into a service. What you pay for as a user, is for time and knowledge. The rewards are intangible yet real. The modern economy is regarded as a service economy, where products no longer stand for the value alone. As Joseph Pine explains, services are customized goods. The next step is the emergence of the experience economy, where "experiences are becoming the predominant economic offering" (Pine, ted.com 2004). When this theory is applied to the 4DSwing case, it becomes clear that in order to compete, the company needs to be concerned about the user experience of their product. It is important for 4DSwing to offer a consistent and desirable service that supplies users with a positive feeling. By researching experience design, it is possible to explain how this can be achieved. In the following sections, I offer an explanation to what constitutes an experience, models that illustrate the experiential factors of a product, and I explain the practical implications of this way of thinking.

4.1 Defining experience design

Experience can be defined in many ways, but perhaps most suitably for this context, an experience is "something personally encountered, undergone, or lived through" (Merriam-Webster online dictionary, 10.12.2010). This definition implies that experiences cannot be avoided, as they are part of the conscious and unconscious structures of our existence. We constantly live through experiences, some are more memorable than others. In reality, we are able to manufacture experiences; "an experience occurs when a company intentionally uses services as the stage, and goods as props, to engage individual consumers in a way that creates a memorable event"(Schifferstein and Hekkert, 2009, 2).

Experiences can be altered to suit any need or desire, and is fast becoming an influential medium for businesses to distinguish themselves from competitors. Schifferstein and Hekkert use the words of Schmitt to explain the reason to do so; "the ultimate goal of experiential marketing is to create a desirable, coherent, and consistent customer impression that enhances the brand image… When people repeatedly encounter a particular brand within the context of a pleasant experience, they are more likely to develop a favorable attitude towards this brand. In addition, characteristics of the atmosphere during the experience (e.g. modern, fresh, impressive) may become associated with the brand" (Schifferstein and Hekkert, 2009, 2).

Designers play a key role in this process of creating meaningful experiences, and creating products or environments are only a means to this end. The experiential aspect of products goes beyond their physical or functional character, and even beyond the usability or interactive dimensions. The experience is more that the sum of these components, since the experience is determined individually. The reason why the experiential dimension of products is so important, is because it extends itself to a much wider context. Form and function of a product are limited in time and space, whereas the experience is something you take with you and remember. Experience design is concerned with not only the immediate experience of using the product, but extends itself to the brand experience, touch experience and the potential experience.

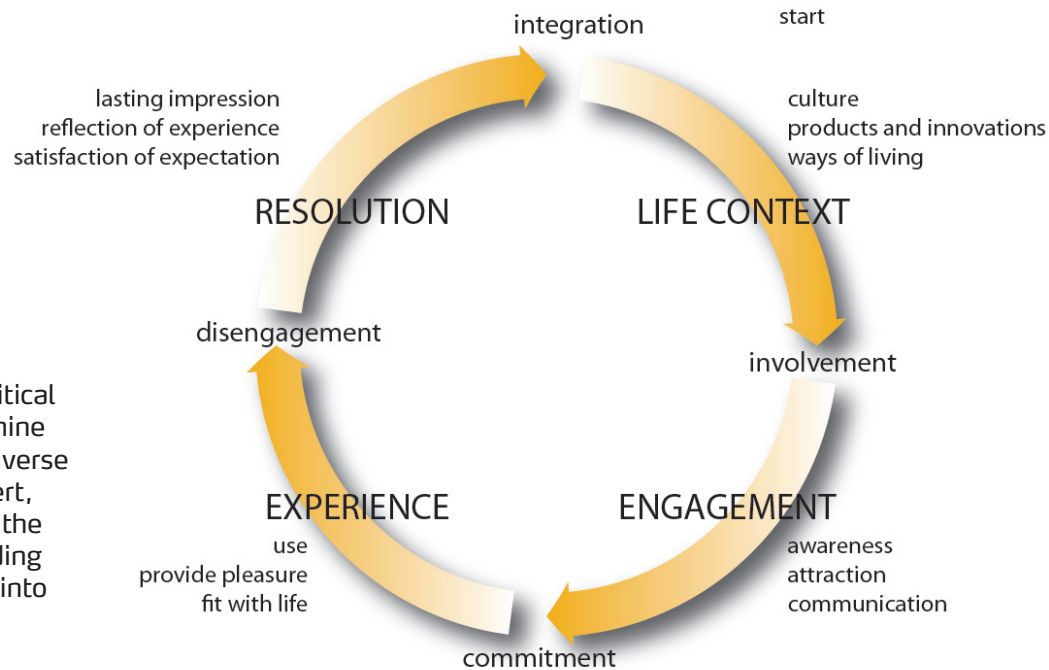
Experiences are valuable in the sense that they shape the attitudes of consumers. A brand may tell the story of a company which consumers identify themselves with, but experiences establish a deeper emotional connection with the user. Branding and designing experiences are very much alike in the sense that the process begins with a product through which a story has to be told. Parallels with branding can be seen in Press and Cooper's idea that "to design through the product, we must first be able to see the world

beyond the product — the social, technological, political and market forces that shape our world, and determine the hopes and fears, joys and pains that form the diverse experiences of being alive" (Schifferstein and Hekkert, 2009, 97). However, the brand is artificial, whereas the experience is authentic; it cannot be avoided. Branding is used to install predetermined values and images into consumer goods, while experiences are acted out.

4.2 The Design Experience Model

Designing for experiences is a challenge since each experience is personally interpreted, but to consider services and products as experiences allows for design to be used as a tool towards creating something truly outstanding and innovative. The idea is to reach the consumer on a physical, emotional, intellectual, and cultural plane. Cooper and Press illustrate the experience model by Darrel Rhea to show the scale at which an experience must be considered when being designed. The model illustrates aspects which involve users and objects from initial awareness, to eventual disengagement.

The process begins with the life context — "the cultural and social background to any new design." This phase looks at how well an experience can become integrated with our lives, and the impact it will have. For companies it is a matter of conceiving the placement of their products and



The Design Experience Model as devised by Darrel Rhea and illustrated by Mike Press and Rachel Cooper, The Design Experience: The Role of Design and Designers in the Twenty-First Century, 2003.

understanding both the user and the user environment. A good understanding of this helps to continue into the engagement stage of the cycle. In this phase, the user discovers the product. At this point, Rhea highlights three aspects which the design must fulfill: "its must make people aware of its distinctive presence, it must attract and hold interest, and it must communicate the product's key attributes." Here, the user must be able to pick up the values communicated by the company, and they must be relevant to the user in order to create a positive interaction.

The experience phase involves the use of the product. It must be noted that by now, the user has built up their

expectations of the product, assuming it will function in a certain way or complete a task. These expectations should not only be satisfied, but be excelled. This is the moment of epiphany for any user, and this is where the contagiousness of the product stems from. It should also be noted that this phase requires maintenance. If an experience remains stale, users will eventually become bored. This is where the company should apply efforts to continuously preserve the value of the experience.

When the product has outlived its peak, and replaced by newer technology, needs or desires, or engagement with the product has otherwise ceased, the user evaluates the attributes of the experience. The evaluation is based among other on how well did the experience satisfy? Were the expectations exceeded? Was it fitting with the life context? Did it make us feel alive? The objective of the company and the success of the design can be measured by the degree of integration of the experience and product into the life context of the user, and wether or not the user will continue to use and buy the brand's services or products. The desired outcome is of course to maximize the number of returning customers by guiding them through the experience cycle in a pleasant manner.

4.3 Creating breakthrough products with the Value Opportunity model

Design can be used to guide users through an event smoothly and painlessly regardless of the nature of the product. The technology is expected to simply work, and as experiences are emotional, a successful experience is just an enjoyable way of doing something. For translating this into the design process Cagan et al. provide a useful checklist by breaking down the issue of value into 'Value Opportunities'. It consists of seven attributes that a product needs to address; emotion, aesthetics, identity, ergonomics, impact, core technology, and quality. Each category is provided with a set of criteria that are useful in terms of design and can be used as reference when designing for an experience.

According to the authors, by following these guidelines, it is possible to create, what in their mind constitute, breakthrough products. When this checklist of sort is applied to any given product, the result is not a product, but a platform that enables positive experiences. In particular, it is the emotive aspect of a design that is often ignored, especially when the product is entirely reliant on technology to function. When speaking of designing experiences, the emotive criteria of the Value Opportunity model is in essence the added magic of the product. It can also be characterized as the most authentic part of the product, as

The Value Oportunity Model

Jonathan Cagan, Craig Vogel, Creating Breakthrough Products, 2002

Emotion:

Sense of adventure: the product promotes excitement and exploration.
Feel of Independence: the product provides a sense of freedom from constraints.
Sense of security: the product provides a feeling of safety and stability.
Sensuality: the product provides a luxurious experience.
Confidence: the product supports the user's self-assurance and promotes his or her motivation to use the product.
Power: the product promotes authority, control, and a feeling of supremacy.

Aesthetics:

Visual: the visual form must relate shape, color, and texture to the context of the product and the target market.
Tactile: The physical interaction of the product, primarily focusing on the hand but also including any other physical contact between the product and user, must enhance the product experience.
Auditory: The product must only emit the appropriate sounds and eliminate undesired sounds.
Olfactory: The product must have an agreeable smell, providing appropriate aromas and eliminating undesirable odors.
Gustatory: Products that are designed to be eaten, used as utensils, or may otherwise be placed in the mouth must have an optimum flavor or no flavor at all.

Product Identity:

Personality: The two main issues in a product personality are 1) the ability of a product to fit among yet differentiate itself from its direct competition, and 2) the connection that a product has to the rest of the products produced by that company.
Point in time: In order for a product to be successful, it has to capture a point in time and express it in a clear, powerful way. Point in time is a tricky combination of features and aesthetics.

Impact:

Social: A product can have a variety of effects on the lifestyle of a target group, from improving the social well-being of the group to creating a new social setting.
Environmental: The effects of products on the environment is becoming an important issue in terms of consumer value.

Ergonomics:

Ease of use: a product must be easy to use from both a physical and cognitive perspective. A product should function within the natural motion of the human body. The ergonomics of the size and shape of components that a person interacts with should be logically organized and easy to identify, reach, grasp, and manipulate.
Safety: A product must be safe to use. Moving part should be covered, sharp corners eliminated, and internal components shielded from users.
Comfort: Along with ease of use and safety, a product should be comfortable to use and not create undo physical or mental stress during use.

Core technology:

Enabling: Core technology must be appropriately advanced to provide sufficient features. Core technology may be emerging high technology or well-manufactured traditional technology, as long as it meets customer expectations in performance.
Reliable: Consumers expect technology in products to work consistently and at high level of performance over time.

Quality:

Craftsmanship — fit and finish: The product should be made with sufficient tolerances to meet performance expectations.
Durability — performance over time: The craftsmanship must hold up over the expected life of the product.

it is directly related to our feelings, and cannot be avoided. In particular, the aspects of sensuality and confidence as mentioned in the Value Opportunity model, are very accurate to describe the reason for why this thesis is concerned with studying the 4DSwing product offering from an experiential perspective. If something could be said to be lacking in the present design, it is exactly these features.

4.4 Contagiousness as a measure of success

Another term to describe efforts in designing experiences is making things contagious. The term is coined by Guy Kawasaki in his book, The Art of the Start (2004). It is used to describe the characteristic of a great product experience, which leaves you wanting more. Contagiousness refers to people being drawn to a product or service and then staying loyal to it. Kawasaki outlines the following aspects for contagiousness: *cool, effective, distinctive, disruptive, emotive, deep, indulgent, and supported.*

Contagiousness is more concerned with the feeling that a product leaves or installs within a user. It emphasizes functionality and technology, but it motivates developers to think beyond the tangible qualities of a product in one word. As was mentioned earlier, a successful experience is just an enjoyable way of doing something, but contagiousness offers a valuable term in evaluating the experiential dimension of that something. It is more valuable to evaluate the success of the experience in terms or degrees of contagiousness, since the term is not as subjective as happiness or playfulness. Contagiousness functions as the degree to which users are likely to return or reuse the product or service, which is essentially the goal. This was also established in Darrel Rhea's Design Experience model. A good experience will make you smile for a while, whereas a truly great one will have you coming back for more; this to me, is contagion.

Contagiousness

Guy Kawasaki, The Art of the Start, 2004

Cool: Cool is beautiful. Cool is hip. Cool is idiosyncratic. And cool is contagious.

Effective: You can't brand crap. You can't brand something that doesn't work.

Distinctive: A contagious product is easy to notice and advertises itself. It leaves no doubt that it is different from the competition.

Disruptive: Contagious products are disruptive. They either upset the status quo or make them go into denial.

Emotive: A contagious product or service exceeds expectations, and by exceeding expectations, it makes you joyful.

Deep: A contagious product or service "has legs." The more you use it, the more you discover it is capable of.
Indulgent: Purchasing a contagious product or service makes you feel as if you've indulged yourself.

Supported: Providing exemplary service makes a product or service contagious.

5
Architecture as a platform for experiences

5.1 Architecture as a trigger for positive experiences with the brand

At the top of his pyramid of needs, Abraham Maslow placed the need for self-actualization. It is therefore fitting to think of the experience economy as an answer to these needs, as self-actualization involves positive experiences. Having established the importance of enabling experiences through technology, products and services, it is possible to introduce a fourth dimension directed towards the use of experience design. An experience requires a location, and a location is captured by architecture. The connection between architecture and self-actualization is that it is possible to create meaningful experiences through architecture, as will be established in the following section about emotional architecture.

5.1 Architecture as a trigger for positive experiences with the brand

Regardless if the product is a service or physical object, the process of turning perceivable information into experiences happens through semiotic transfer. Architecture has established that it is possible to enclose experiences, and with the emergence of the new economic model, it has become more important than ever to appreciate this. As Anna Klingmann establishes; "for architecture in the experience economy, the relative success of design lies in the sensation a consumer derives from it — in the enjoyment it offers and the resulting pleasure it evokes" (Klingmann, 2007, 9). A valuable thought that is derived from experience design is the requirement to connect the dreams and desires of users to the architecture. The point is not to control an experience, but to simply trigger it.

Klingmann argues for the need to design buildings that are branded. Buildings that support the values and visions of companies and people, that enables users to feel and experience the brand. In her opinion "by creating reactions without words, through the look and feel of people, places, and things, experiential environments show rather than tell, delight rather than instruct. The effects are immediate, perceptual, and emotional" (Klingmann, 2007, 42). The idea is that buildings and the surroundings can be shaped in ways that contribute to the overall experience. The issue of authenticity, for which also Pine advocates, is also present when it comes to product architecture. Klingmann calls out that "while it is vital for architecture to express identity, it will not be achieved by applying weary clichés but by communicating points of difference that are based on the authentic expression of personality and character" (Klingmann, 2007, 313).

The previous quote accurately describes the difficulty of the work for this thesis; How to design something that is an authentic expression of the personality and character of 4DSwing? Klingmann supports the creation of experiences through design that bonds emotionally with people when she claims that "architects must focus their attention on the atmospheric effects that architecture can produce and the sensory experiences created by its use" (Klingmann, 2007, 313). The final purpose of why the product architecture is related to experience design, is the associative effects of design that triggers emotions. The nature of the experience becomes associated with the product or brand, it is the way how we organize our mental image and our feelings towards a product. Klingmann explains that "in remarkable spaces, experiences are not just embodied by architecture — they become the architecture. Architecture that bases its inherent value on the experience of the user is ambient and dynamic, ideational and economic — a space beyond the purely physical. It becomes a catalyst for cognitive, behavioral, and relational values that ultimately replace functional values" (Klingmann, 2007, 313). In essence, Klingmann coins the potential implications of this work for 4DSwing. The idea of creating a catalyst of feelings and behavior is, first of all, fundamental in understanding the problem at hand, and secondly, and secondly, a leading thought throughout the research and design phase for this thesis.

6
Research Methodology

This section is concerned with describing the methods and tools necessary to conduct the practical part of the thesis work. The nature of the work is to enhance the user experience of 4DSwing. More specifically I am to create a space which contributes to the overall experience that embodies brand values, and triggers emotional responses. To achieve this, clear research objectives are necessary which then guide the methods used to achieve results. A theoretical structure is also used to organize the design process.

6.1 Research objectives

The problem at hand was formulated in cooperation with company representatives Seppo Karikko, and Vesa Perälä. After a preliminary examination of the product, it was decided that a central command space is needed to add value to the 4DSwing product. Therefore, the objectives of the research for the design phase is concerned with the following:
To accurately interpret the brand.
To interpret the values and logistics of the company.
To understand the dynamics involved when using the equipment.

6.2 How to interpret the brand

As I have access to the records that document the creation of the 4DSwing brand, studying this information is of great importance. They must not only be studied, but also interpreted on a personal level. My interpretation must also be verified by the company. It is therefore necessary to establish a platform that summarize the given documents and my personal interpretation. The intention is to establish a reference point together with the company that guides our discussions for the designs.

By studying the values behind the brand, key values that relate to physical attributes can be extracted. The selection of values form the base for mood boards. Through attaching images that I feel relate to the chosen values, a network of words and images are combined to form comprehensive mood boards. These boards convey the message that 4DSwing desires to communicate through its existence, as interpreted by me. Having a visual reference tool, makes it possible to compare and contrast competing products and establish a unique design direction for 4DSwing.

6.3 How to interpret the logistics of the product

The 4DSwing product is a result of many elements. These elements form a logistical chain into which an implemented design must fit. A buyer Experience Cycle Evaluation is used to establish the existing boundaries of the company. This tool is a template for interviewing a company representative, that provides questions that would otherwise not be considered or answered.

The Buyer Experience Cycle Evaluation is part of testing for exceptional utility in the book Blue Ocean Strategy, by Kim and Mauborgne. Exploring these questions makes it possible to understand the product from a buyers perspective, and showcases the real issues that a design must deal with. The purpose is not to perform the entire test for buyer utility as shown in the book, but to use the Buyer Experience Cycle Evaluation to look for clues that will help make any design proposal more realistic. The information gained from this interview is scattered

across the whole thesis, forming the base for most of the background knowledge about the company and the equipment. For an illustration of the model, please refer to the appendix.

6.4 How to understand the dynamics involved when using the equipment

Understanding the whole user experience before improving any aspect of it, is an important objective of the preliminary research. The entire cycle as described in the Design Experience Model by Darrel Rhea, needs to be mapped out and reviewed. To help document this, a visual storyboard is necessary. This method involves gathering information from a set location, which is the Season Golf facility in Suomenoja, Espoo, Finland. Season Golf will act as the setting for the majority of the research as it is currently the only commercially used 4DSwing product in Finland. However, the concept will not be tied to this specific location as the company distributes internationally. An experience story board helps visualize potential barriers to a better experience, and acts as a showcase for the company for further development.

Besides interviewing and meeting regularly with the company, interviewing the owner and manager of Season Golf, Erkki Välimaa (the first person to ever have bought a 4DSwing product) is valuable. His insight helps to establish the practicalities related to the 4DSwing product after it has left the hands of the company. By knowing how potential buyers think about and perceive 4DSwing technology, verifies the intentions of 4DSwing as a brand. The purpose of such an interview is to establish a buyer's expectations of the product.

6.4.1 Observing users

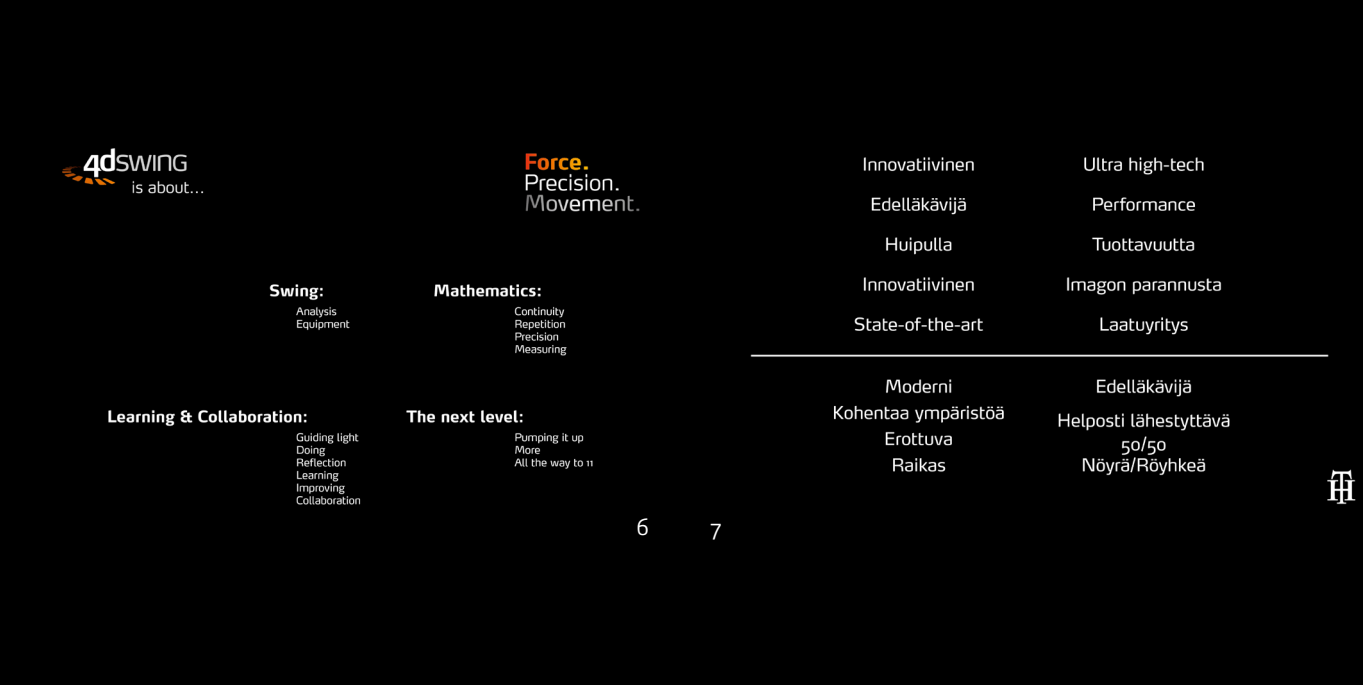
Studying users is an elementary process of any design process, but if looked at more specifically, ethnography is a term better suited at describing the method best suited exploring the world of experiences. As Press and Cooper establish; "ethnography has been described as a mapping of the mundane. Alongside quantitative methods, research makes use of participative observation, interviews, oral histories and, of course, deep hanging out" (Press, Cooper 2003, 118). It is the ability to be discovery-oriented, to observe the problem from multiple perspectives. Emphasis is on this 'deep hanging out' as familiarizing myself with all aspects of the product is necessary, including learning how to operate the system. Educating myself with operating the system will allow me to perform any number of demonstrations with real subjects, thus sharing the experience with them. In becoming the instructor, it is possible to perform trials that would otherwise be beyond pure observational methods and manipulate them. My position as a hobbyist with

respect to the topic strengthens the ability to observe individual experiences, as well as reflect upon my own experience using the equipment. I am not forced to imagine the experience of someone else, as would be the case if emphatic research methods were used.

This makes it possible to experiment, and thus, experience first hand the experiences of other users. For the demo trials, a wide range of subjects can be chosen at random for short trials and then discussing their experiences and feelings with them during the instructional process, while simultaneously observing them. Observing and interviewing other instructors will act as counterweight to my personal observations and experiences. By assuming the role of an instructor, it is possible to address the issues of those who will most likely be using the equipment the most; whereas a student will spend anything between fifteen minutes to an hour in the immediate vicinity of the machine, an instructor will spend many more, as they are also bestowed the responsibility of equipment operators.

7
Preliminary Research

The theory for this thesis is concerned with experience design; the practical part makes use of the theory. Prior to beginning the conceptual phase, a thorough benchmarking and observational process was necessary. The practical work can thus be separated into two phases; the first deals with analyzing the company, familiarizing with the equipment, interviews with key people, and a qualitative user study. The results from these efforts serve as the background for the design drivers. The second phase interprets the design drivers into concrete ideas through creative methods. This latter phase illustrates the conceptual phase, the concept selection process, concept refinement, implementation, testing, and a detailed description of the proposal.



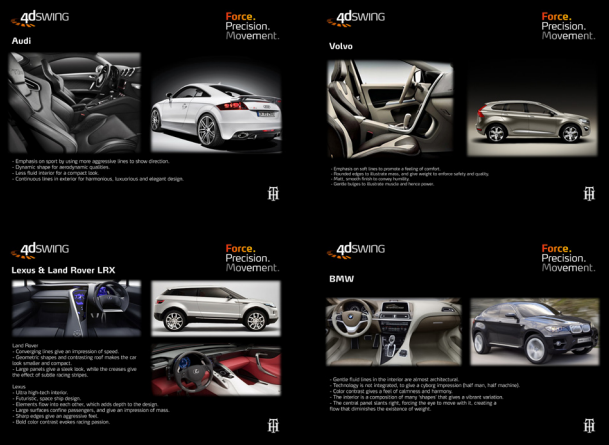
Ill. 6 & 7 show the keywords that were used to create the 4DSwing brand prior to this thesis.

Ill. 8 describes the ideal user of 4DSwing through various products.

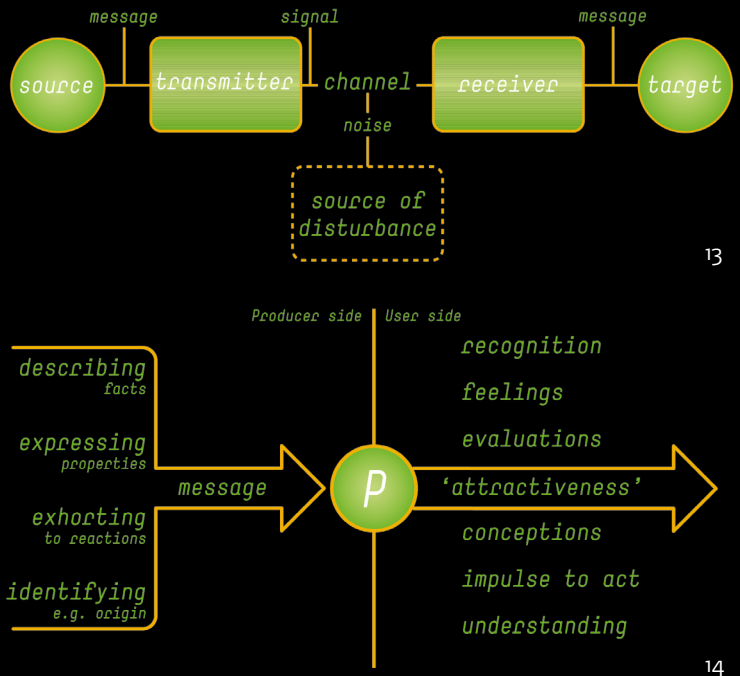
7.1 Brand analysis results

The majority of the brand has been previously covered, but as was mentioned, an accurate interpretation of what the image and values represent was needed. Only once I felt completely comfortable with the 4DSwing brand, was I able to proceed. During this initial phase, I had numerous informal talks with Vesa Perälä, with who we discussed the target audience, the aspirations of the company, and the desired image or impression 4DSwing presents. I was fortunate enough to have the initial brand planning questionnaires and summaries available, from which it was easy to extract the most important aspects of the brand. I summarize the brand values in the illustrations. The values below the line at the bottom of the brand summary, are the values chosen to guide the physical character of the design. They were chosen because of their relation to physical properties (ill. 6 & 7).

When talking to Vesa about the meaning of the brand, the lifestyle it suits, and the desired image, there was plenty of talk about cars, technological gadgets, fashion, and other lifestyle services or experiences. The brand study by Dialogi Oy includes a fictional character who represents the ideal user. As a response, and to exhibit that I had understood the 4DSwing brand, I created a collage representing my interpretation of the ideal user. This updated visualization served as a solid point of reference for our group discussion with Vesa and Seppo. Since the brand was established in 2008, my interpretation ensured that the company was still thinking along the same lines. Together it was established that the ideal person using the 4DSwing product would be someone active, on the go, use an iPhone or iPad to



9-12



Ill. 9-12 show the 4DSwing brand compared to car brands and models to establish a desirable design direction.

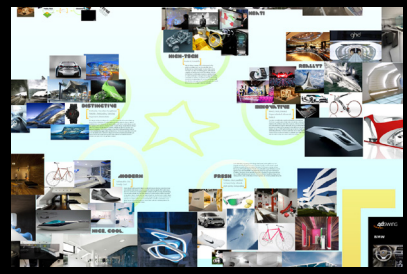
Ill. 13 & 14 Semantic models as presented by Rune Monö, Design for Product Understanding, 1997. These models helped me convey the idea to the company of the reality and importance of semantics.

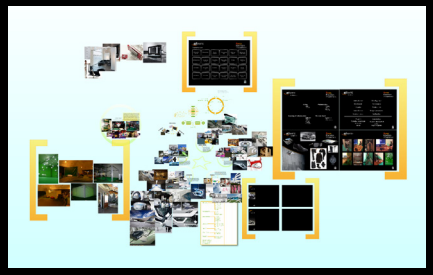
access their 4DSwing account, and probably drive an Audi or BMW. He would also wear fashionable and technical clothing during his busy journey through life (ill. 8). Much of the discussion focused on the kind of car that 4DSwing represents or associates itself with. Audi, BMW, and Lexus are brands that Vesa and Seppo imagine their product to be like. I took this notion and made a visual study of these brands, and included Volvo as an additional reference (ill. 9-12). Analyzing popular objects of this kind, made it possible to think along the lines that if this ideal person were to enter the 4DSwing space, and emptied their briefcase and pockets, those objects would not look out of place or context.

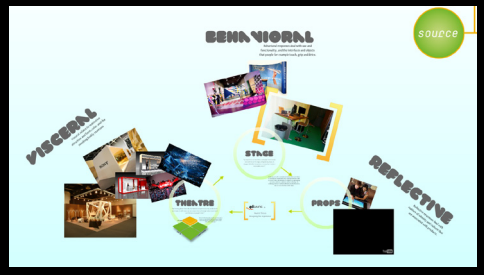
Studying the car brands together with Vesa and Seppo, made it clear what was meant by 'high-tech' 'modern' or 'distinctive.' It was during this time that I began to apply the principles of semantics, as we discussed the visuals in the light of semantic principles of Rune Monö. This made me committed to design a concept that followed these principles and interpreted the 4DSwing brand accurately. Using a semantic model allowed me to evaluate my designs during the entire creative process.

7.2 Mood boards as visual aids

From the brand analysis, I took five words that kept repeating themselves in our discussions, and were highlighted throughout the brand creation documents. The five characteristics that are important for the brand are high-tech, innovative, fresh, modern, and distinctive. I began to collect images that I felt expressed one of these characteristics, and created five collages that radiate the







15-22

Ill. 15-22 Screenshots of the moodboards. They represent a visual collective for inspiring the design process, and were used to communicate the general design direction to the company.

given vibe. For coherence, I included illustrations of the same product category for the different words. For example, I categorized soccer shoes, watches, cars, and architecture for each of the words, so that each category of products could then be contemplated (ref. ill. 15-22).

I would later build on this platform whenever I found an appropriate image. This solid base was approved by the company, and served as a valuable tool for the design process. The mood board was made using Prezi, an online presentation tool. The flexibility of the platform allowed for the consistent structuring of research material. Having all images, graphs, models and text in one place made it possible to discuss the content in close cooperation with the company.

7.3 Visualizing the entire experience

The Design Experience Model taught me to think about the totality of a product. I am commissioned to conceptualize only a part of it. As an exercise, I mapped out the entire cycle illustrating how the entire user experience unfolds. The example focuses on the experience that involves the Season Golf complex in Suomenoja, Espoo. I photographed the path from beginning to end, and structured the experience into 24 stages. I studied users through this path, and accounted for their behavior. Added to this, I followed the path myself on more than one occasion. I gathered photographic evidence of the majority of stages, and created an interactive flash-file where clicking on a stage would reveal images relating to that aspect of the experience (ref. ill. 23).

Ill. 23 A screenshot of the interactive experience map. This was the platform for collecting visual material about the entire experience cycle.

Ill. 24 A collage of images depicting some of the most poignant observations made in the user study phase.

Through this process, I found many aspects that contribute to the entire experience, and I was able to establish the position and the importance of creating a designated space. Mapping the experience was also intended as a tool to show the company what other measures it could take to complement the experience. The map also illustrates the scope of this thesis by defining the boundaries of the work. I was able to select only a selection of frames, and focus entirely on those that are directly relate to the actual machine.

7.4 User study observations

The 4DSwing product is relatively new, and there are few active users of the equipment. Studying users was very difficult because of this. Another problem with studying users was that the system was not functional for much of the time. This severely limited the amount of users I was able to study. I did manage to follow some users from a distance, and those sessions were recorded. Informal interviews with these users revealed mostly their frustration with the system, and concentrated mostly on the results of the analysis. However, this was never the intention of the user study. I recorded their movements, and looked at their communication with each other and the data from the monitors.

Studying subjects from a distance revealed many interesting habits. I discovered how users undressed their outer-clothing, changed shoes, crouched over the table to read from the monitors, the amount of space used by

students and instructors when analyzing, how they bring with them food or drinks to the site, played around with loose golf balls, and leaned on surrounding furniture. The site at Season Golf is littered with cabinets, equipment, and other distractions that were consciously and unconsciously noticed by users and that distracted them from having a concentrated and unrestricted experience that is derivative of the 4DSwing brand (ref. ill.24).

I was given a thorough lesson in the use of the equipment, and I studied the user manual for interpreting the data in order to give my own lessons using the system. Anticipating the obstacles mentioned above, I was able to prepare the space in a way that removed as many of the obstacles as possible, and at other times, I introduced additional obstacles to see how the students would react. Some students were provided with a thorough explanation of the situation, where they should go, what they should do, where to stand etc. whereas others were guided more freely. I noticed how my behavior influenced that of the subject. The subjects would begin to imitate my movements; for example, if I was hunched over the table, or leaned over a chair in a certain way, the subjects would do the same in thinking this was acceptable. If I stood at a distance from the monitors, so did the subject.
The demonstrations I conducted were free of charge for all subjects. Therefore they were all very pleased with the experience, as the data that was provided gave them new insight into their game. However, they question remains, what if they had been paying customers? Would they have been equally pleased with the experience? As a professional golfer working with the 4DSwing equipment, using the space as a temporary office, it all felt a little cheap. I was disorganized as clubs, balls, wristbands, screwdrivers, cables, scissors, papers, were all scattered around the place, in a space with poor lighting, and surrounded by students whom were constantly confused. Knowing the high standards of quality that golfers are used to, this setting does not suffice. A visit to the club houses, pro shops, equipment stores, or practice facilities it makes it clear just how high golf's aesthetic standard is. I consider a good golf swing the most valuable thing a golfer has, and the 4DSwing equipment and experience should reflect that.

7.5 Design drivers

Once the company understood what I meant with creating a trigger for an exciting experience, I felt that I had a sufficient background with the product, the brand, and the experience to establish a few key aspects that the concept needs to address. These qualities are formed into design drivers.

The Design Drivers

- The design has to reflect and complement the 4DSwing brand.

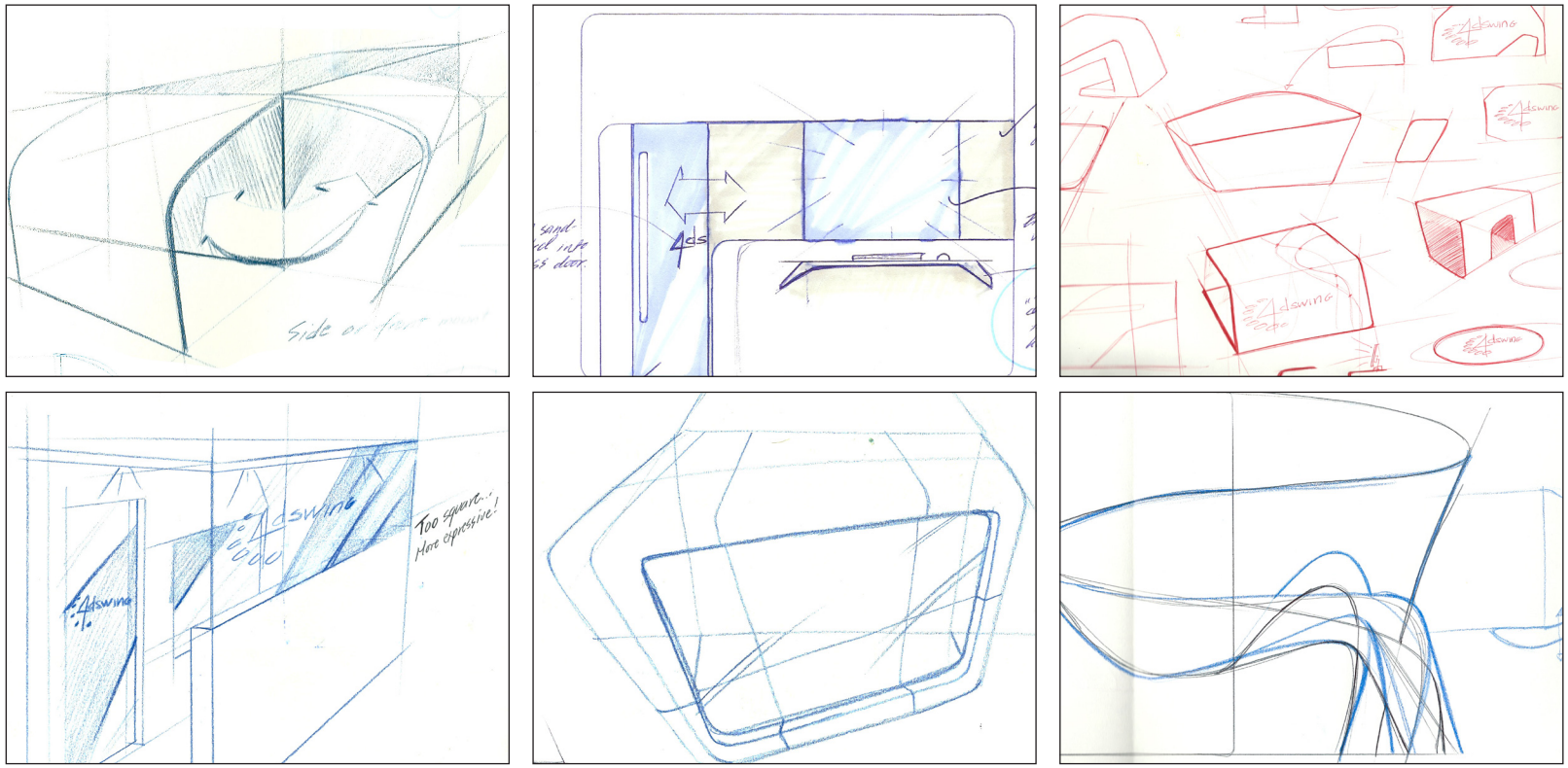
- The design needs to be simple. It should be easy to install, and affordable to manufacture.

- The design has to be universal. It needs to fit into any context (physical and cultural).

- The design must facilitate the use of the equipment and complement the teaching process.

8
Designing the Ideal 4DSwing Space

Before starting the design process, I familiarized myself with the thoughts of Donald Norman, to act as a counterweight to the business oriented models previously covered. Norman argues that any product has a visceral, behavioral, and reflective dimension (Donald Norman, Emotional Design, 2004). By being aware of these dimensions, it was possible to evaluate primary sketches and develop them further. Norman's logic was very influential in establishing the key questions that any ideas had to answer. Together with the company, we discussed the need to the space to be open or closed; whether or not outsiders should have a view of what is going on, and how much privacy is needed during a session. The one thing that circulated most in my mind at this point was how do people enter the space. In relation to any given space, should the subjects approach from the side or from the front? What is the definition of the front, side or back of this existing box, as the canvas can be opened from any corner? A special attention towards the visceral dimension was given at this point in time, and I was encouraged to do so on behalf of the company. The beginning of the design process was thus very unrestricted.

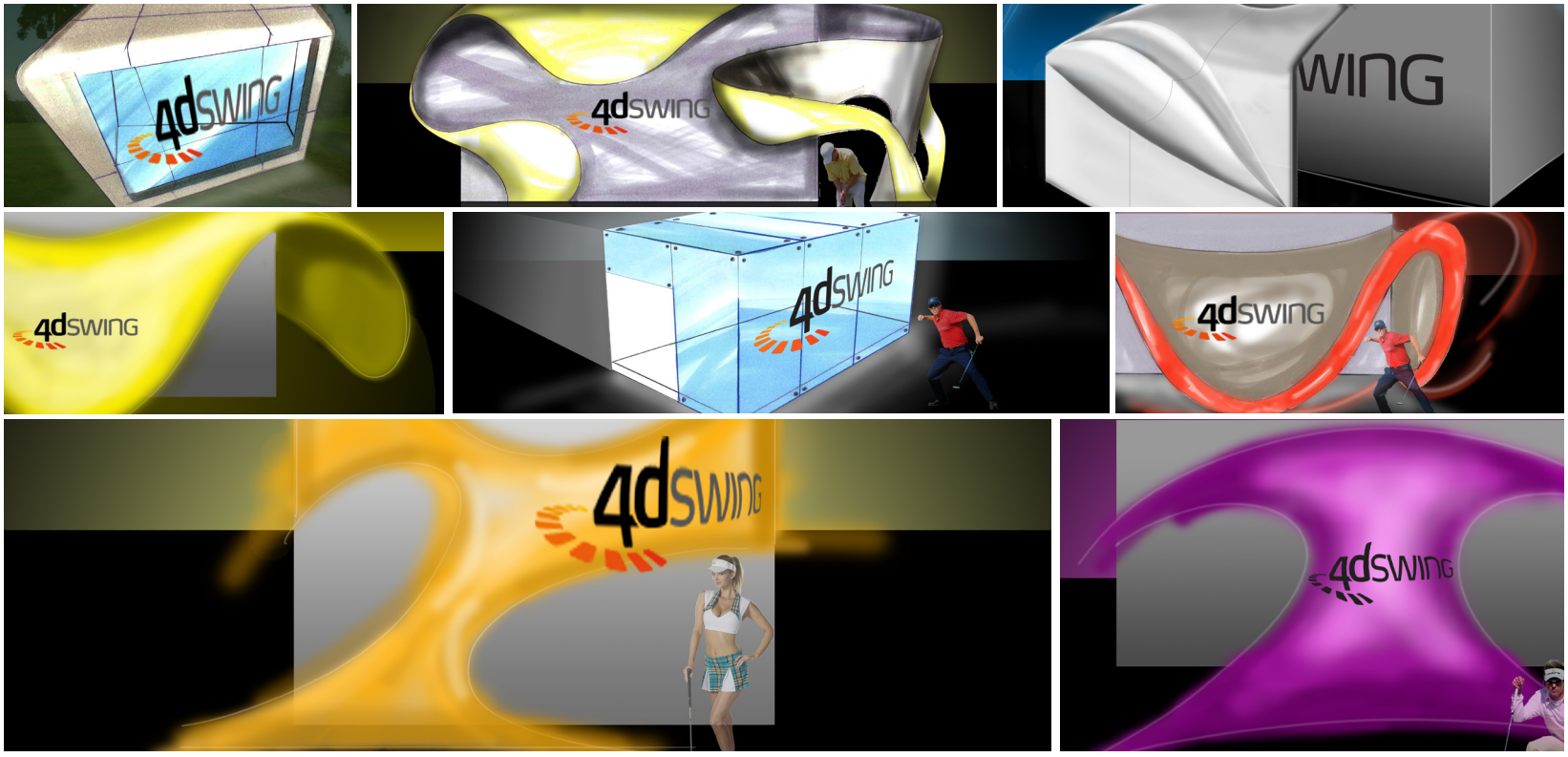


This page and opposite: Sketches and first round drawings.

8.1 First round concepts: A mix of ideas

From the initial ideas that made it from sketches into more developed concepts, fifteen ideas were chosen to be presented. I felt like these ideas represented a varied portfolio of designs, which could all be further developed in the case that they pleased the company. I wanted to show an array of different materials that could be combined to embody the 4DSwing brand, such as glass. Some of the designs were purposefully ambitious, and some would require professional assistance in installing them, especially the capsule designs. I included these designs as there had been discussions about the setup of the equipment using an external contractor. Such contractors would be able to assemble much more elaborate designs, as it would not be a one man effort as it is now.

The play with privacy is continued in the first round concepts. The glass walls offer a glance of the proceedings inside, and the more abstract structures using stretched canvas act like a bikini, covering only the essential parts, giving at least some protection. The stretched canvas structures were formed during the process where all the logical possibilities had been exhausted. Once I had sketched enough solid structures, I felt stuck. To help me move on, I began to ignore the meticulous approach of trying to embed the brand qualities into the design through stylized features or details. I began to work more freely, more expressively. I began to think what it would be like to use the existing canvas material as the main component, and how to, in a sense, make the structure more organic. This placed an immediate new and exciting flow to the designs. The shapes were more dynamic and reflective



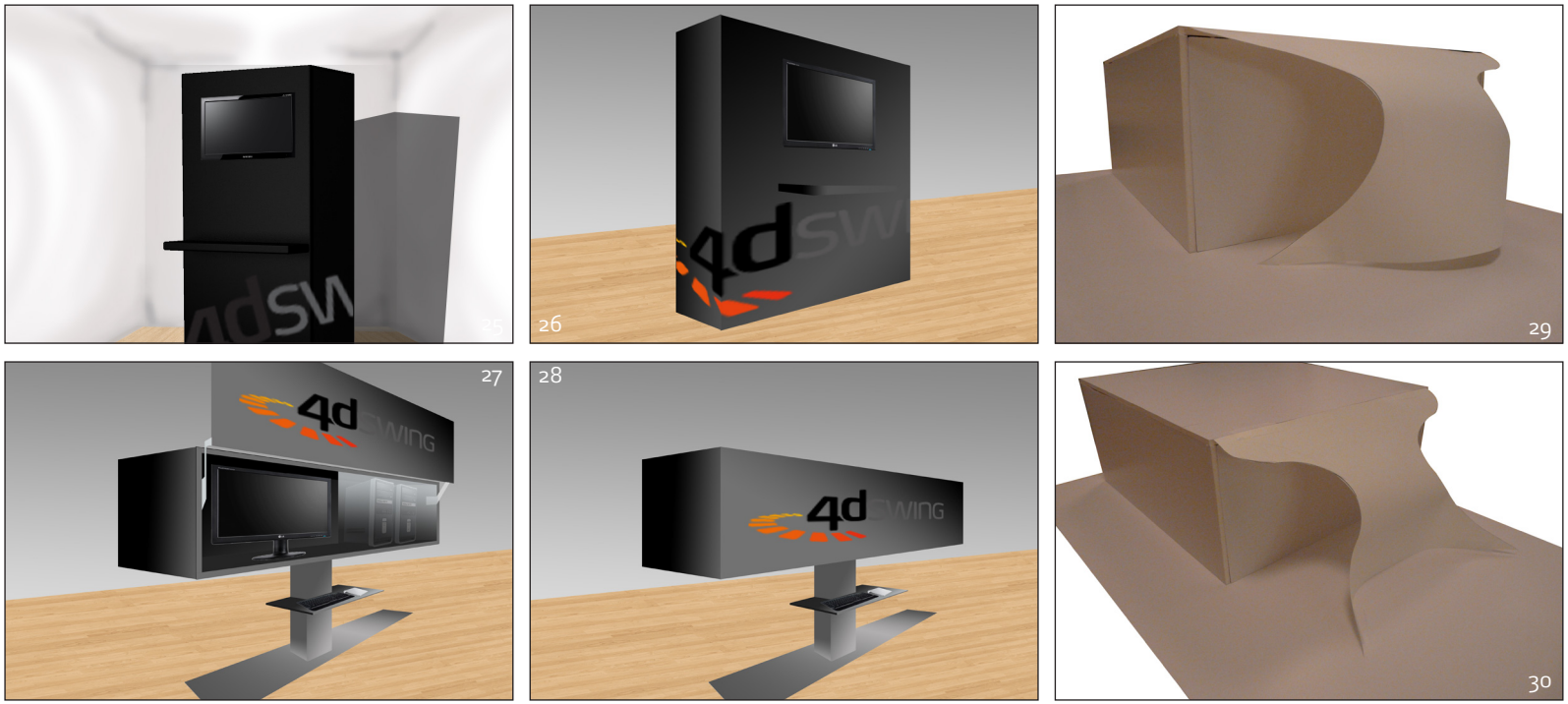
of the brand qualities on an abstract level. The company slogan Force, Precision, Movement became ever more prominent in leading the design process.

The fifteen designs were presented to Vesa and Seppo during a meeting, where a Value Opportunity Chart was introduced. The chart considers product factors that Cagan and Vogel identify as aspects that are essential in making breakthrough products. The chart was intentioned to be base over which to discuss the individual proposals. All the designs scored high in certain categories, but none of them stood out to their advantage at this stage. I was left to develop each concept more in the direction established in that meeting. Collectively we wanted to see more of the interior and how that would reflect on the total experience before excluding any designs.

8.2 Second round: Refining ideas

The second phase of the design process began by looking at the essentials for the interior. It was already decided that a more ergonomic teaching position is needed, one that promotes clear communication. The last thing the interior needed was another desk. I had made some initial sketches of desk units, none of which I felt adhered to the design drivers. The idea was to make a work station that required users to stand upright, and be rid of all the clutter. A station that would promote cleanliness, order, and function. I developed a series of different cabinets that would house the monitors, computer, servers and wires. By hiding all the unnecessary parts of the hardware, the space would look professional and organized.

During my experience studies, I had discovered that access

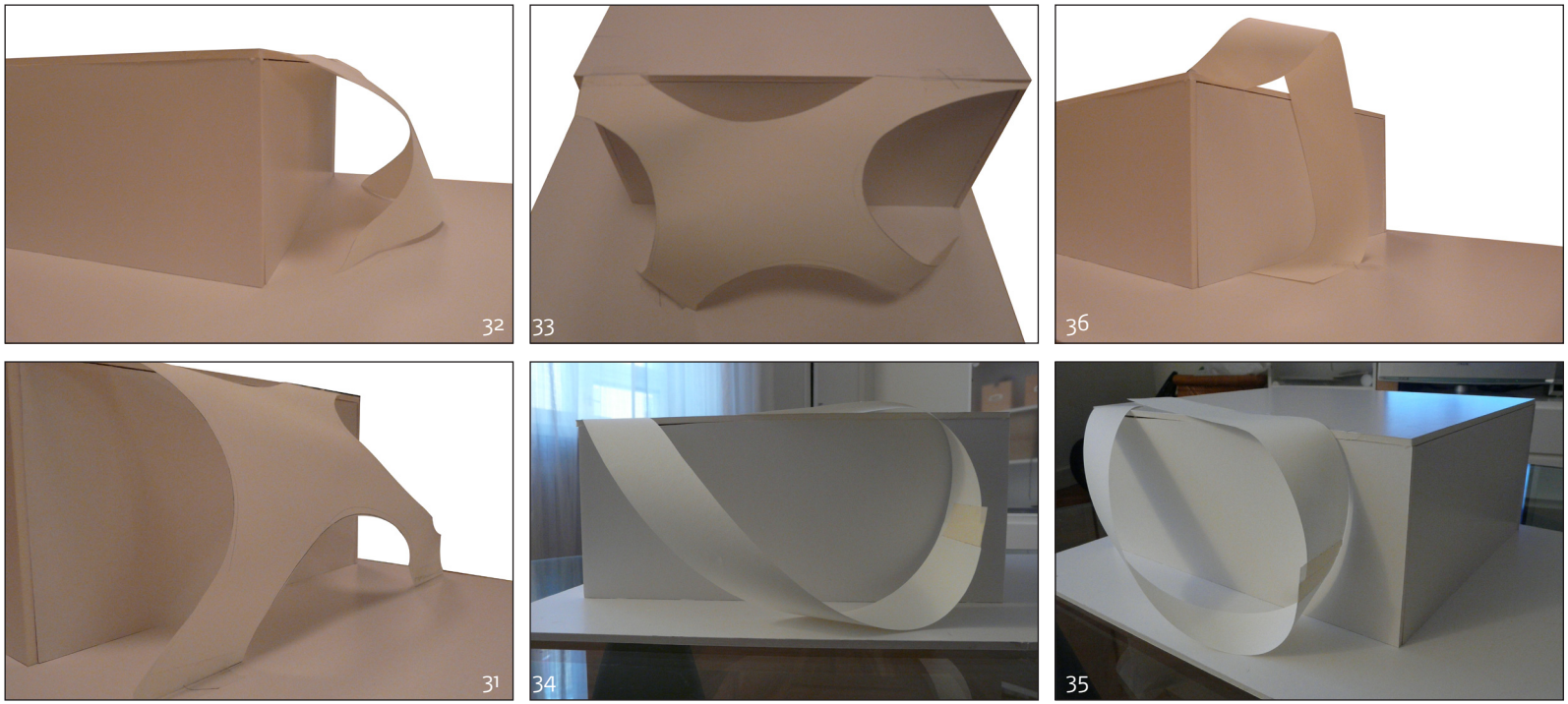


Ill. 25-28 Visualizations of cabinet alternatives.

to the computers was essential. USB-sticks needed to be used, rebooting was required, rewiring was not uncommon, and general picking around the hardware was evident. This point was highlighted by Tapio Santala, the chief system developer, when I asked him about the possibilities of using a touch screen system in the future. He was wary of using such hardware as he needed full control of the hardware for maintaining and upgrading the system. The point is therefore, that those who are in charge of maintaining the system spend more time on their knees reconfiguring wires and hardware, that easy access to it is essential.

I knew I had to design something that would allow for this. If the hardware was supposed to remain hidden, it also needed to be exposed when necessary. The cabinet concepts all revolved around this idea, and I benchmarked many ways to open and close drawers and doors. I was inspired by kitchen designs, as they have the same problems.

The concepts from the first round were reviewed, and I began looking at how a cabinet would fare in each space. I also reviewed the dimensions for the space, which made me realize how large the structure would become. I realized that a solid structure would become too large and massive for the space, which resulted in dropping many of the capsule designs. Instead I began to focus on the idea of using canvas as a thin, light and flexible building material. Visualizing the ideas became easier once I constructed a scale model of the studio structure and began to model my visions. I took the most suitable designs and made paper versions of these. I then made alterations to them and

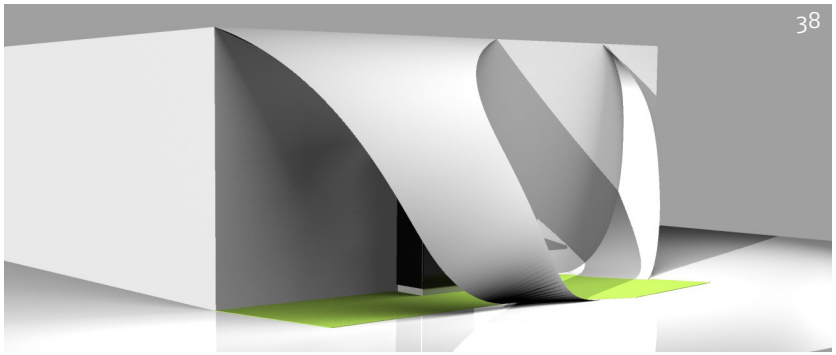


Ill. 29-36 Photographs of the scale model. I used paper and carboard to explore the shape of the canvas

experimented with their shape and structure to get many variations of the same design.

I found new shapes through experimenting further, and came up with two new ideas that build on the previous designs. I felt that these design expressed simplicity and were dynamic. They made the studio tent look much less like a box, which I was striving for. Depending on the angle, the stretched, looping canvas structures give some notion of privacy, while defining the boundaries of the teaching space. I explored the possibility of having a space that was inviting when not in use, yet defined when being used.

When these new ideas, derived from working with the model, were presented in the next meeting with the company, they were immediately approved as better alternatives to the previous suggestions. They offered more possibilities in terms of placing them in different contexts, and required less effort in interpreting them. The cabinet proposals were also met with a positive inclination, and one alternative was chosen for further development. This model provided the most potential in acting as a stable pillar as it was the largest and most simple of the proposals. It was also the easiest model to customize. The initial cabinet model was designed to hold one large monitor, but new developments by the company required the addition of a second display.



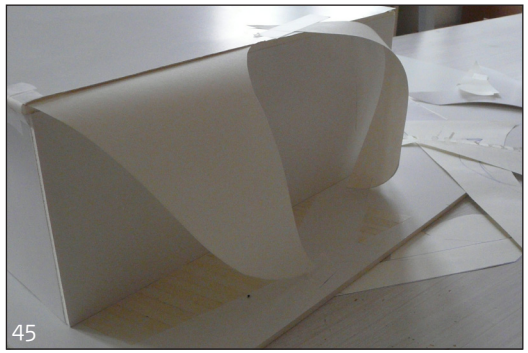
Ill. 37-40 Two designs were chosen for exploration in the third round. One was the large loop, the other a bulged 'X.' The loop design was considered by us all to have the most potential for final exploration.

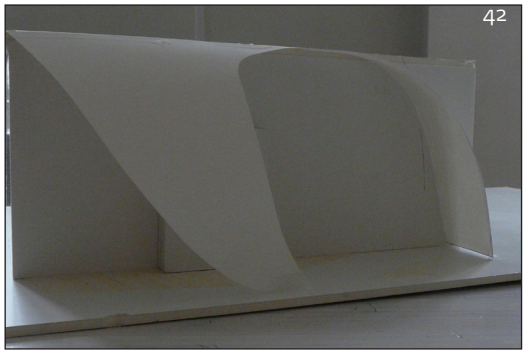
8.3 Third round: selecting a final idea for detailed exploration

Two designs for the canvas structure were chosen for further exploration together with the one cabinet model. For the third design meeting, I prepared variations of each canvas design, with subtle differences. Two of the strongest designs were modeled on the same platform to facilitate their comparison. The final decision took place next to the analyzer at Season Golf, which allowed for Vesa, Seppo and me to visualize the design better while making the final cut. From this point onward, the design needed to be reviewed and planned according to specification. We selected the concept on grounds that it reflected the values of 4DSwing, and that it had a universal application. This was an important part of the design process as it offered some conclusion to the creative process. Beyond this point, I was able to begin refining and fine tuning the concept, test its feasibility, and explore the full potential of the design. One key aspect that was not yet developed at this stage, was the graphical element of the canvas. I had developed some renderings which included the company logo and some other visual elements, yet these were by no means intended as final propositions. More time and effort would be needed to explore the graphical elements.

9
Final Concept Development

Once we had established the general theme and shape of the design, I began to work with the details of the concept. All previous models had been devised with simple materials, and very little thought had been focused on the structure of the design. The first step was to establish how fabric could be sculpted into the desired shape. Some quick and dirty mock-ups were created to test the design. I also explored different variations on the smaller paper and cardboard model. Through studying these and trying to imagine a real situation within this space, I became increasingly worried about some aspects of the design. Mainly, it was the curvature closest to the ground that I began to see as an obstacle. My fear was that people would accidentally trip on the canvas. I was also wary of the feasibility of the design, as it proved difficult to simulate the desired shape with the models. I used my knowledge of the space and the events that occur within in it, to review the initial concept. Having done so, I chose to alter the canvas shape. However, I wanted to maintain the overall impression and design. I began to explore ways in which I could keep the general shape and eliminate the obstacles I feared. The solution began with removing the lower curve that touches the ground.





Ill. 41-46 More development was needed to explore the looped canvas concept. Eventually the loop element was dropped, but the general impression remained. These pictures show various models that explore the general shape of the canvas.

Throughout the conceptual phase, I had developed the chosen concept on the principle that entering the space would be possible from any angle. By not defining the entry, I still wanted to establish a space with clear boundaries. I used the theoretical lessons of Christian Leborg, from his summary on 'Visual Grammar' about invisible and inactive structures to develop this theme. In the book he explains invisible/inactive structures as follows: "Although the structure lines in an abstract structure are invisible, our brain has a tendency to fill in what is missing, so we see where they are. Inactive structures indicate the position of the objects but do not affect their form" (Leborg 2004, 24). This idea that the brain is able to work out the missing links is important to understand the final design.

The final design plays on this ability. The canvas, as it is bent in two directions, creates surfaces that are perpendicular to each other. This visual cue is that the surfaces would eventually meet at a right angle to each other. This 'corner' does not of course exist, but the impression is nevertheless there. This helps to frame the space, and forms a kind of 'grey-area' where a person is neither inside or outside the space. This transitional area is intended to invite people in, as well as refrain them from getting too close in the case of an ongoing session inside. Wether or not this will translate in reality remains to be seen.

The revised design also makes use of another element that was present in the original concept. When looking at the design head on, the eye does not perceive the whole structure at once. The viewer sees the larger part of the

Ill. 47-51 Once I had the shape I desired, I built larger scale models to test the pheasibility of the design. This scale model (1:23) was a sign that the design is able to support itself.

surface which covers the cabinet. This way, those inside using it, are sheltered from those who otherwise would have a direct view of the computer screens. Thus there is nobody breathing directly in their neck. Once a bystander moves around the structure, more of the shape is revealed (ill. 54).

The same is true when looking at the structure from the side. The front part of the design is reduced to a thin profile, which matches the side profile of the side wall. This repetition of form, makes the structure appear lighter and more delicate than any of the other proposed concepts. The visual play of the walls removes any efforts in trying to fortify the space. Having a massive structure that viewers see head on can be interpreted as intimidating. Much of the success of the design depends on its ability to attract curiosity, while giving a feeling of privacy to those inside.

9.1 Allowing light to enter the space

The obscurity of the design also allows for light to enter the space. Originally, I was planning to insert additional lights to enhance the space. With the correct lighting, a specific mood could be established within in the space. Lighting is an unknown factor with regard to the positioning of the equipment. As would be expected, any space where the 4DSwing equipment is erected, there is some source of light. This is accounted for in the proposed design. The intention is not to block light from entering the space. If however, it is discovered that the space is deprived of light, it would not be difficult to address the problem onsite. Lights could be used to light the space from the ground up, by placing floodlights or strips of commercially

available floor lights at the bases of the canvas walls.

The cabinet containing the electronics required to operate the equipment, could be lit from behind. It would give an added flair and possibly enhance the atmosphere. Many modern televisions have this feature (to decrease eye fatigue, but also for decorative purposes). The lighting element would need to be studied and experimented with almost specifically onsite. It is not resourceful at this stage to delve into this matter further, other than perhaps address the issue an establish general guidelines for the company to heed in the future.

9.2 Describing how and why the cabinet works

The cabinet is a result of the human needs and behavior witnessed at the Season Golf facility. It is justified to think that the same needs and behavior will be universal. The cabinet has a very specific purpose, namely to hold and secure the expensive hardware. This also eliminates the visibility of the wires, electrical cords and extensions, which at present give an impression of disorder and untidiness. Furthermore, as became evident in the user study, the cabinet is designed to house coats, shoes, and accessories. By placing them inside the cabinet, they do not become obstacles. Also the additional accessories placed there by the company, such as tools, wristbands, balls, tape, clubs, pen and paper, and promotional material can all be stored


52


53

Ill. 52 & 53 I needed to test my theory of encouraging users to a better posture. I built a lifesize mock-up of the cabinet, which was then used in real teaching situations. This proved out to improve the comfort of teaching, and fascilitated communication between subjects.

within the same cabinet. This is also helpful for professional users of the equipment as they may store folders, tools and miscellaneous equipment needed to teach. The cabinet can be altered according to specification, and accommodate additional equipment, such as a printer. With reference to Don Norman, the cabinet represents largely the behavioral dimension in the design.

A rough prototype of the cabinet was constructed, enough to try out the dimensions and how it would fare in a real teaching situation (ill. 52 & 53). I repeated demo trials with new users and was able to conclude that the solution is efficient. It fulfilled the requirements and it was much easier to converse with the participants. The cabinet structure allows for people to get much closer to the monitor without having to push anyone away, and two people are able to share the space better. I did, however, notice a tendency to place loose objects on the

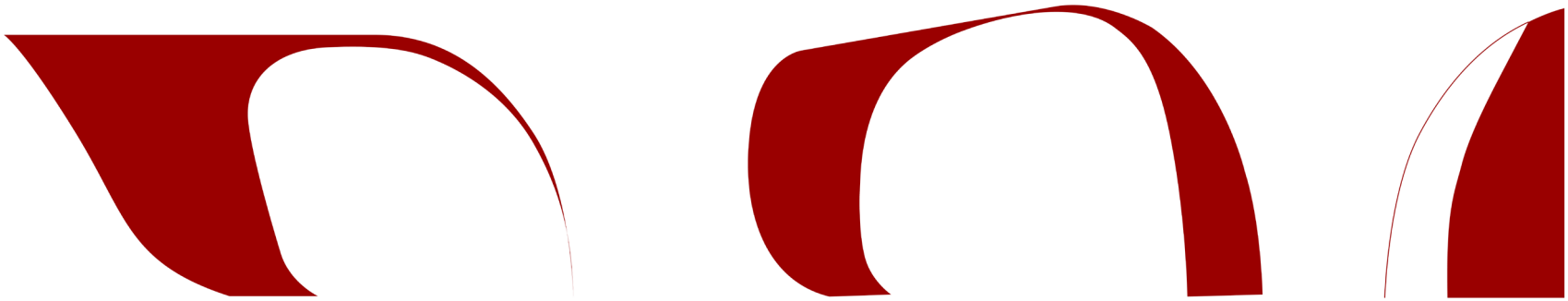
keyboard shelf, as it was much wider than necessary. This strengthened the idea of having a retractable shelf that is only as large as the keyboard. An all-in-one system is thus proposed. A cabinet not only makes the space more functional, it largely removes the necessity of additional features such as a coatrack, or a basket for balls and wristbands.

The positioning of the monitors was tested and verified according to ergonomic standards (Jorma Saari, Ergonomian perusteet, 1982). By placing the screens at eye level, it encourages subjects to a better posture, which in turn facilitates communication between the teacher and student, as neither are hunched over. The positioning of the keyboard is also strategically placed at a height that is comfortable enough to operate. The degree of difficulty users will have in operating the keyboard, which is placed well below the monitors, depends on the skills of the user in their ability to operate a keyboard and cursor. In the design, it is proposed that the keyboard and mouse are integrated within a retractable shelf that moves in an out of the front panel. If such a design is implemented, I suggest that a wireless Apple keyboard and Trackpad are used. The flat surface of the Trackpad allows for the elimination of any loose pieces, which are subject to theft, misplacement, or falling off the shelf. Regardless of which keyboard and mouse are used to operate the system, the idea is that the shelf on which they rest, is only large enough to house a keyboard and mouse. This reduces the chances of using the shelf as a place of storage, and it would discourage users not to lean on it for support.

9.3 Freedom of movement within the space

The way people behave within the space can be estimated according to the studied behavior of subjects, as presented previously in this study. The space is designed in a manner which takes into account the varied movements involved when teaching golf. The canvas structure is soft, which does not inflict any harm on golf equipment even if struck with a golf club. There is enough room to make swing movements and if more space is required, the generous openings are there to facilitate this. It must be remembered that the design is made for ideal conditions. During prolonged sessions, subjects may want a seat, which is why the space is generous enough to accommodate chairs. This option is not presented in this work, since it was found in the studies that subjects did not express to be seated during a session.

How people walk through the space has been given much thought during the design process. More importantly, the application of the design has been a priority. The proposed canvas concept can be mounted on any side of the studio, and the main opening can be positioned to point either left or right, according to the needs of the site. Even



0°
As seen from the front.

45°
Slanted view

90°
Side view

Ill. 54 Showcasing the graphical element of the shape of the canvas.

if a location does not have the capacity for the canvas construction, the cabinet is sufficient to provide a controlled and desirable user experience.

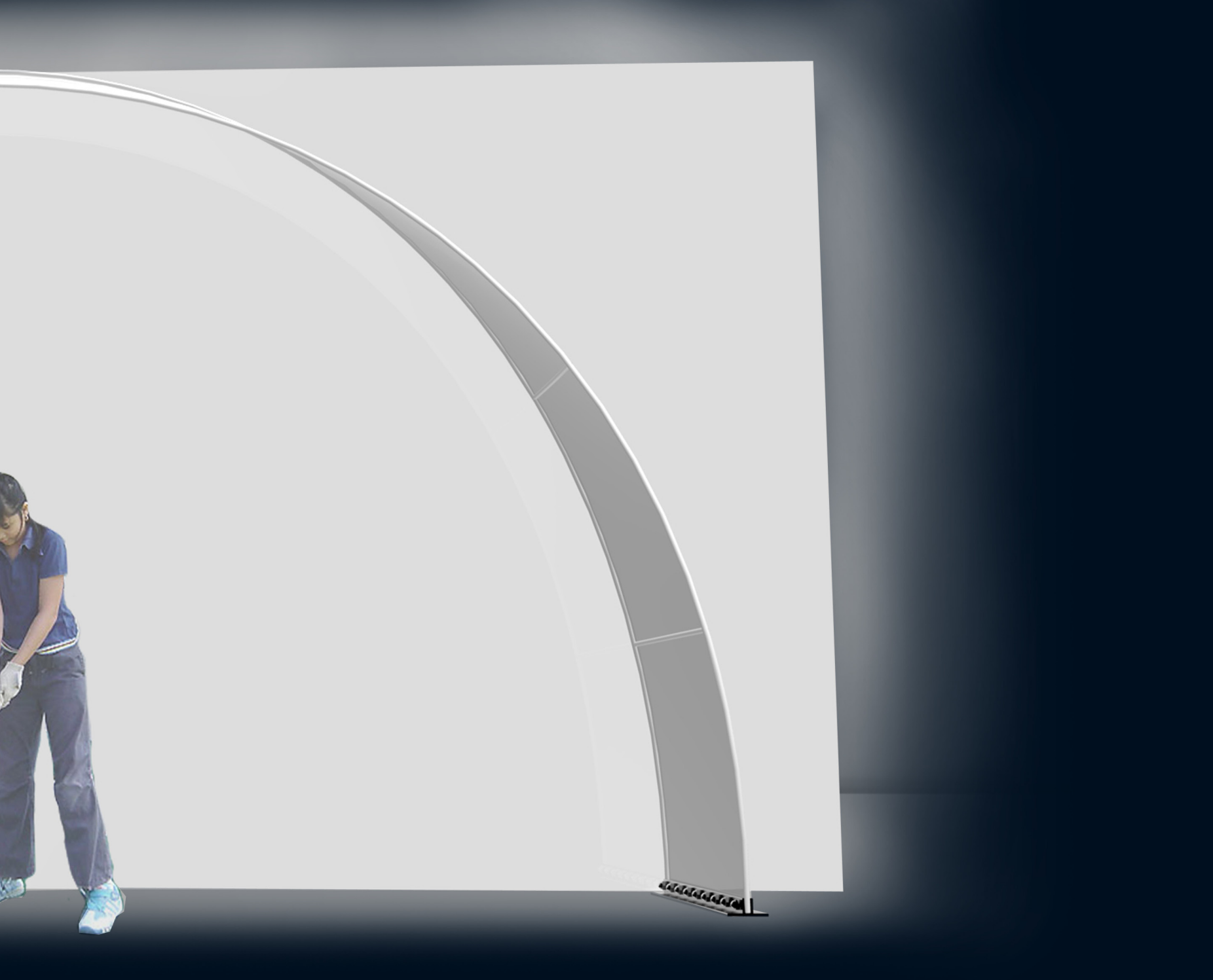
9.4 Graphics as a subtle element

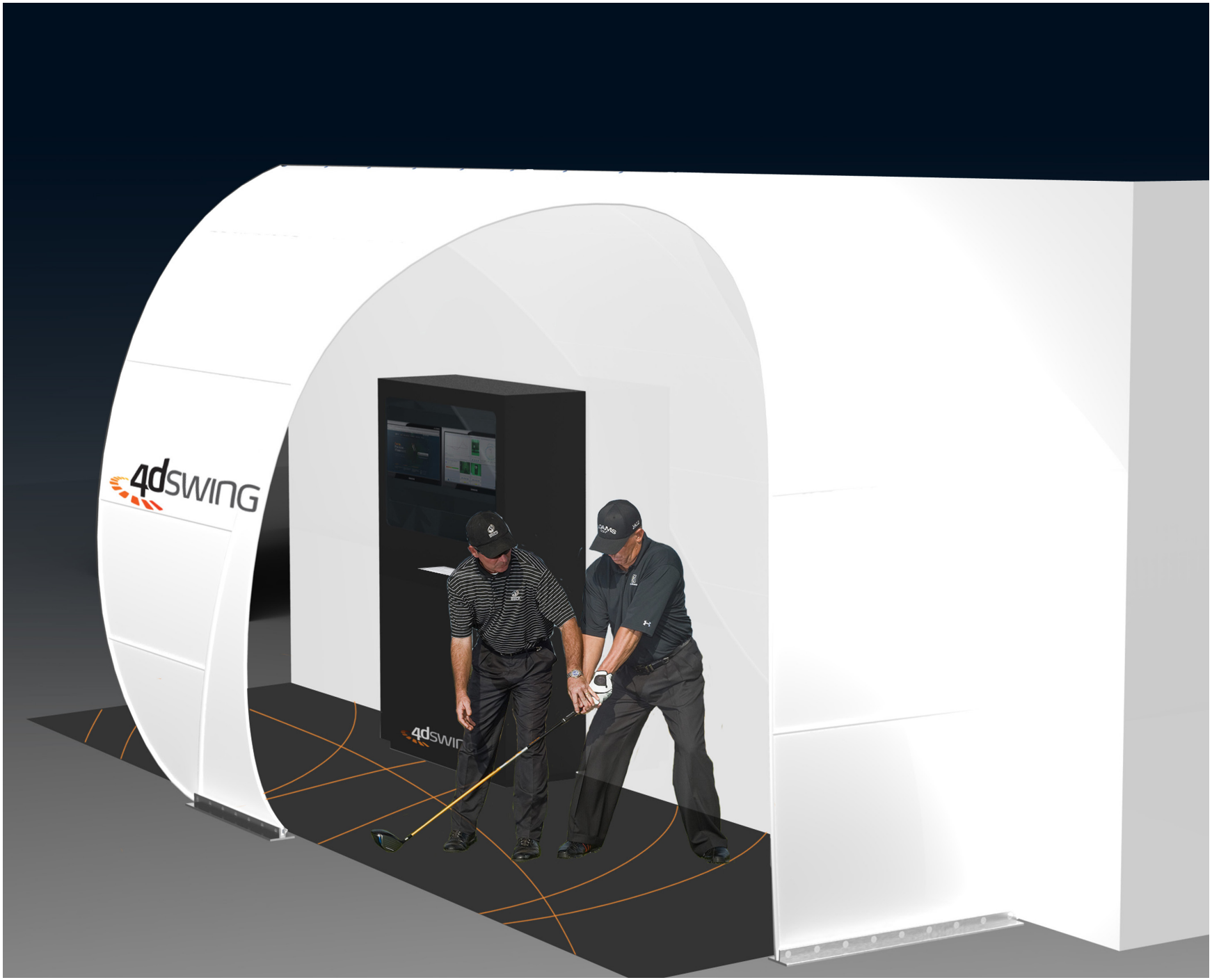
Graphically, the concept adheres to simplicity. In doing so, the form of the structure is prioritized. The intention is to have the canvas as a structural element, not as advertising space. Throughout the design process, many graphical elements were experimented with, but non ended up giving the design any added value. The shape of the canvas is in itself a graphical element. It could be argued that the plain graphics stem from the mood boards. Those objects that were inspiring throughout the whole process also speak through subtle graphical elements. As intended, the mood boards have been an important source of creativity and influence.

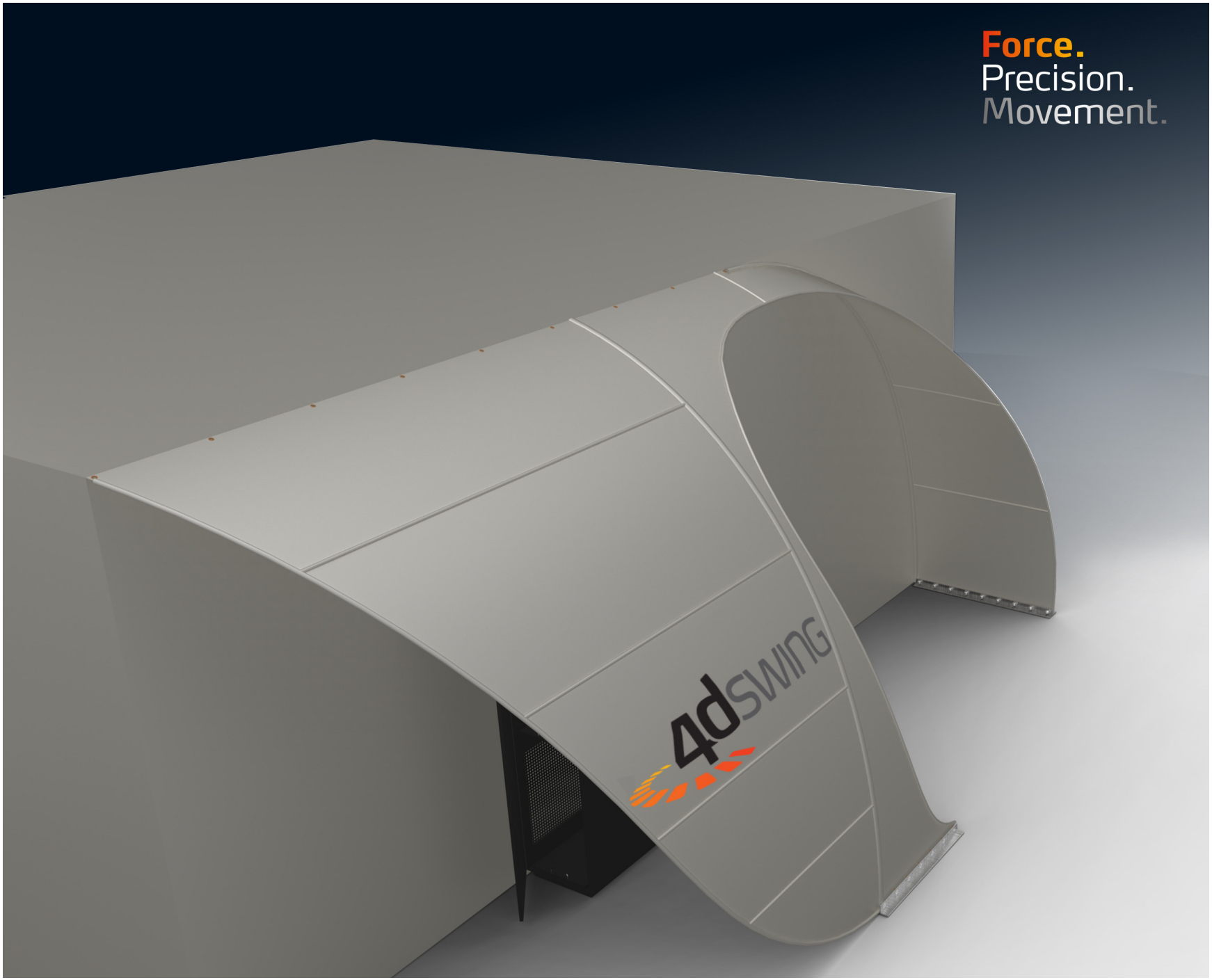
10
Concept Renderings

In the following pages, a collection of renderings are showcase the final proposed design. It must be considered that the images serve the purpose of guiding a possible constructor to comprehend the overall design. Detailed material qualities remain undefined at this stage, since they will we determined together with the constructor. The images have been enhanced using the 4DSwing brand; this tests the suitability of the design with the existing brand qualities. Another feature which has been left open for deliberation is the anchoring of the canvas structure. One design was implemented in the working protoype, but depending on the rigidity of the supporting battens, these will most likely have to be altered.


4dswing

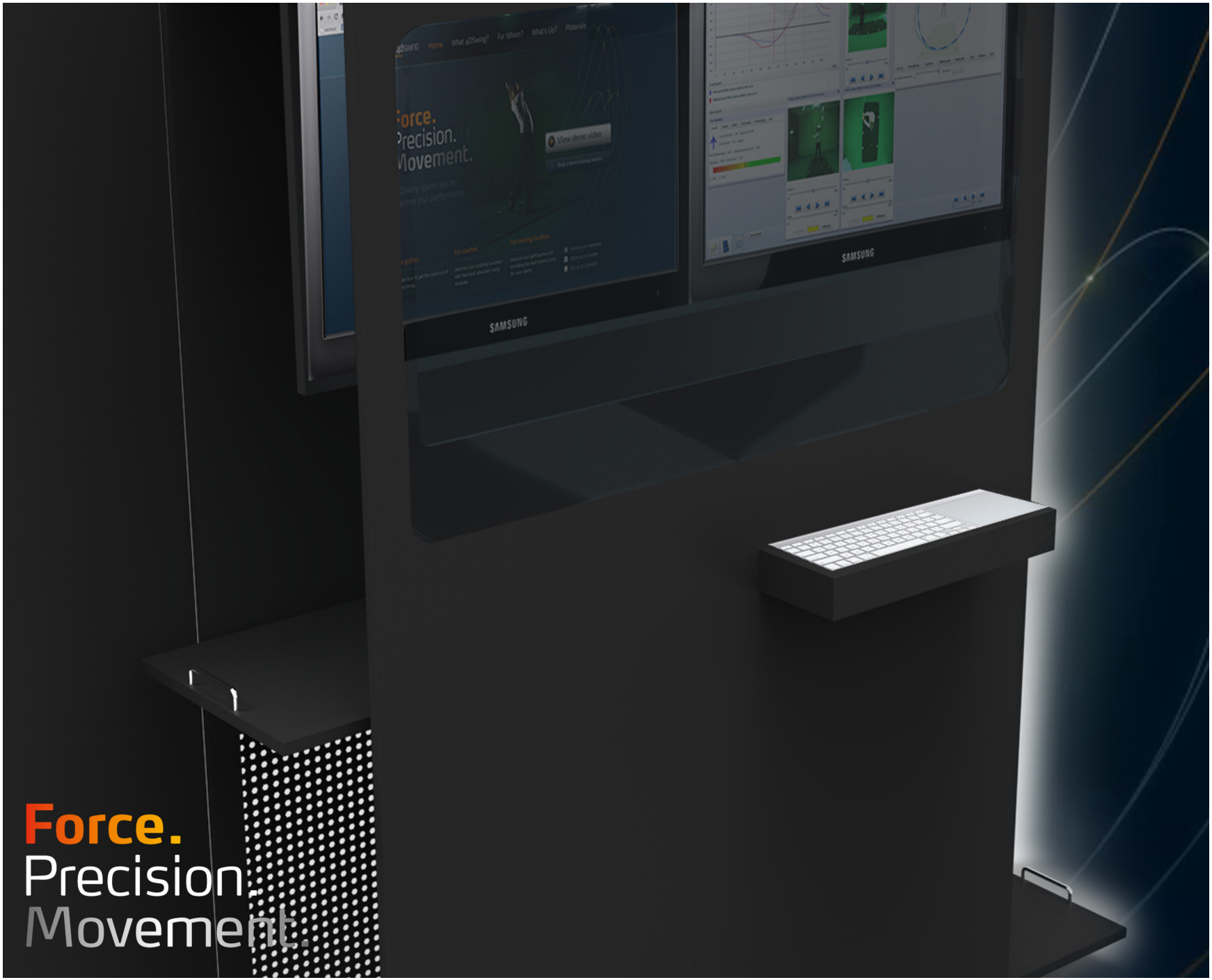



4dswing
4dswing


Force.
Precision.
Movement.
4dSWING

Force.
Precision.
Movement.


4dSWING
Force.
Precision.
Movement.


Force.
Precision.
Movement.


Force.
Precision.
Movement.
4DSwing sparks you
to improve your performance
4dSWING

Conclusion

This project began with an extensive mapping of the company, brand, and equipment. Through building a solid foundation with insight into the dynamics of the company, it was possible to extend the theoretical elements into practice. Knowing the central problems and key points, which were suitable to explore for the scope of a thesis, was essential in communicating the project plan to the company. The theoretical models were used to guide the design process, and evaluate proposals.

The proposed concept is reliant of the 4DSwing brand. Each decision taken during the process involved evaluating it against the brand. The methods used in this thesis are commonly used successfully elsewhere, which is a notion of their validity. They allowed for flexibility and freedom of interpretation. The mood boards were divided into five categories, which made it easier to classify visual aids. Attaching visuals to the words derived from the brand creation documents made it easier to communicate their true meaning and possibilities. Another important exercise including visual aids, was how we discussed the character of the 4DSwing brand in terms of car brands. By looking at examples of how others have turned values and brand associations into physical products, the company was able to grasp the challenges in creating the ideal design for their product. The methods I used could have been explored further, but the extensive background material that I was provided with was incredibly rich in information, and I was able to concentrate more on the design process. Indeed, I studied the brand manuals and the brand creation process documents very carefully in the beginning.

Referring back to Toni-Matti Karjalainen's words about the tangible product features and intangible brand associations, they are yet to be fully explored, since at the time of writing, the designs have not been implemented. The tangible and intangible qualities can only be observed once the designs are implemented. However, the renderings and models display sufficient evidence of the feasibility and qualities needed for evaluating the design against the mentioned theory. The true nature of the design can only be studied through the real material qualities.

The proposed designs of this thesis are concerned with the current situation. The intention of the study was to create a feasible solution proposal to the problems adhering to the theoretical framework discussed in the beginning of this thesis. This causes the study to be slightly bias towards the setting at Season Golf, where the majority of the research was done. This does not mean that other solutions were not considered. Some alternatives involving touch screens were discussed with the company, but researching technological alternatives would steer away from the theoretical framework. Suggesting the implementation of a touch

screen is only relevant in the case that the user interface is thoroughly reviewed, which is another chapter in creating the ultimate user experience for 4DSwing.

The next phase towards implementing these design would require a thorough examination of alternative constructors and cost calculations. Although free hands were given by the company to create a desirable design, the cost of the design was constantly considered. Chances of implementation are much greater if the designs do not require a large commitment of resources. The designs can be realized with commonly available materials, as became evident during a visit to a sail manufacturer in Helsinki.

The research for this project is intended to serve 4DSwing as an encouragement towards creating a desirable user experience. The research identifies many aspects that need improvement, and most of these were discussed with the company during the process. The experience map conveys this idea. Having said this, this thesis proposes only one final design. Realistically, there are a number of options available for the company to implement. These options mostly rely on available elements common at, for example, trade fairs. These options do not convey the true spirit of the brand, and their creative use is limited. In contrast, the objective of the thesis was to create something that reflects the brand. Using prefabricated elements is therefore not an option if the desired outcome is supposed to adopt the brand holistically. My personal opinion is that the designs have great potential, and the arguments for implementing them are given in this thesis. Referring back to the principles for breakthrough products by Cagan et al., the proposed concept is unique, and unlike anything competitors offer. It increases the product identity by firmly establishing a space that is entirely dedicated to the needs of users, while simultaneously reflecting the entire brand. This makes the entirety more emotive as it offers users a more luxurious experience by promoting authority. There is a sense of order with something that tells users that this is a serious product, a serious brand that is proud of itself, and wants to offer their customers the best results through a handsome product package. The aesthetics for the design are meant to appeal to the target market and consumer. It is desirable that users feel that 4DSwing is the ideal extension to their golf game also aesthetically. Using Kawasaki's thoughts on contagion, the concept is able to make the product advertise itself. It should feel indulgent by making the experience aesthetically coherent and in line with the high expectations of golfers worldwide. Since there is an abundance of substitute products and services in the golf industry, there is no room for products that are not capable of these things.

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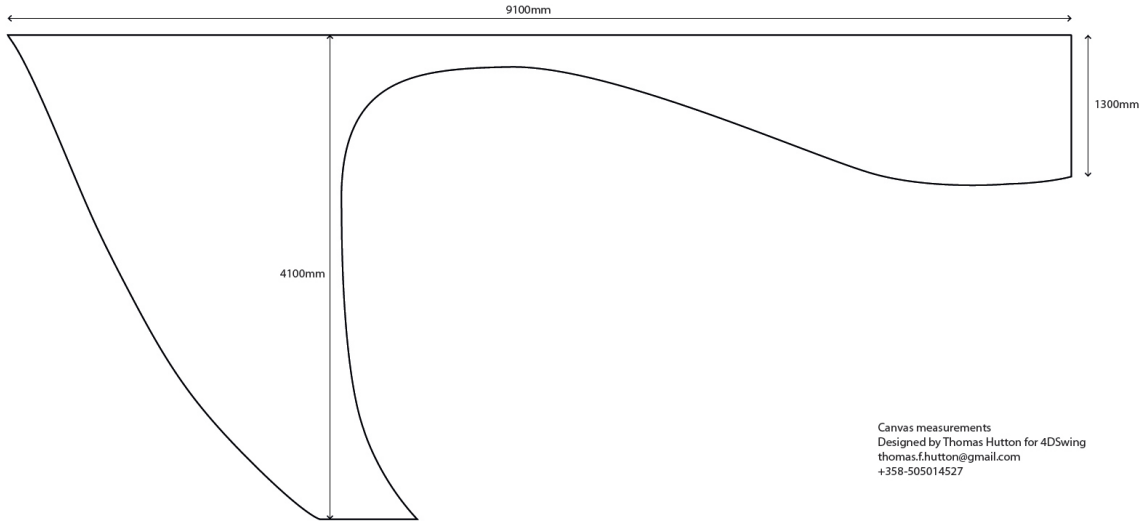
Appendix



Canvas measurements
Designed by Thomas Hutton for 4DSwing
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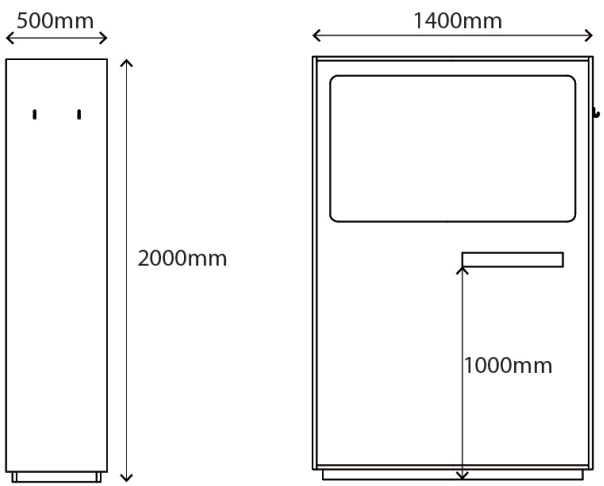
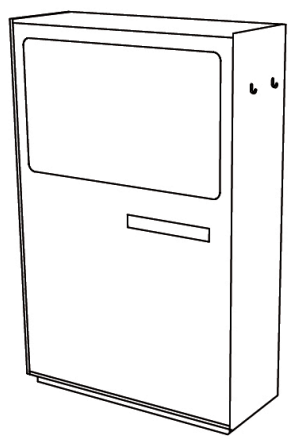
+358-505014527





Cabinet measurements
Designed by Thomas Hutton for 4DSwing
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The dimensions of the concept are at this stage not strictly defined. The exact measurements depend on the manufacturer and specific hardware that will be used. The measurements provided are guidelines for further exploration.

The Buyer Experience Cycle

W. Chan Kim, Renée Mauborgne, Blue Ocean Strategy, 2005

Purchase

How long does it take to find the product you need?

Is the place of purchase attractive and accessible?

How secure is the transaction environment?

How rapidly can you make a purchase?

Delivery

How long does it take to get the product delivered?

How difficult is it to install the new product?

Do buyers have to arrange delivery themselves? If yes, how costly and difficult is this?

Use

Does the product require training or expert assistance?

Is the product easy to store when not in use?

How effective are the features and functions?

Does the product or service deliver far more power or options than required by the average user? Is it overcharged with bells and whistles?

Supplements

Do you need other products and services to make this product work?

If so, how costly are they?

How much time do they take?

How much pain do they cause?

How easy are they to obtain?

Maintenance

Does the product require external maintenance?

How easy is it to maintain and upgrade the product?

How costly is maintenance?

Disposal

Does use of the product create waste items?

How easy is it to dispose of the product?

Are there legal or environmental issues in disposing of the product safely?

How costly is disposal?